DOCUMENT RESUME

ED 393 401 IR 017 736

TITLE	The EDUTECH Report, 1995-96.
INSTITUTION	EDUTECH International, Bloomfield, CT.
REPORT NO	ISSN-0883-1327
PUB DATE	96
NOTE	97p.
AVAILABLE FROM	EDUTECH International, 120 Mountain Ave., Bloomfield, CT 06002-1634 (one year subscription, $97).
PUB TYPE	Collected Works - Serials (022)
JOURNAL CIT	EDUTECH Report; v11 n1-12 1995-96
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Educational Technology; *Higher Education; Hypermedia; Information Technology; Newsletters; *Technological Advancement; Telecommunications
IDENTIFIERS	Administrator Involvement; Faculty Attitudes; *Role of Technology; World Wide Web

ABSTRACT

This document consists of 12 issues, an entire volume year, of the EDUTECH Report published between April 1995 and March 1996. The newsletter's purpose is to alert faculty and administrators to issues in educational technology. Each issue typically contains two feature articles, a page of news briefs, a preview of the upcoming issue, and a question and answer column. The cover articles include: (1) "Telecommunications Issues in Higher Education" (Davis J. Ayersman and Daniel K. Anderson); (2) "Hypertext: Hyperware, Hyperchondria, or Just Hype?" (Howard Strauss); (3) "Can Technology Save Higher Education?" (Martin B. Solomon); (4) "You're Never Really Educated without a SMILE" (Howard Strauss); (5) "Counter-Implementation Strategies" (Steven Gilbert); (6) "Hot Issues 1995-96" (Thomas Warger); (7) "Advanced Technology Groups: Essential or Indispensable?" (Howard Strauss); (8) "Retrofitting Academe: Adapting Faculty Attitudes and Practices" (LeAne Rutherford & Sheryl Grana); (9) "At the Crossroad: Higher Ed and Technology Development" (R. Grant Tate); (10) "Structural Principles for IT Organizations"; (11) "Dear Webby--Advice for the Web Worn" (Howard Strauss); and (12) "The Productivity Paradox" (Paul Attewell). (BEW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

THE EDUTECH REPORT

April 1995

Volume II
Number 1

The Education Technology Newsletter for Faculty and Administrators

ED 393 401

Telecommunications Issues in Higher Education

by David J. Ayersman and Daniel K. Anderson

There are many questions raised by the use of computers and communications, particularly within education. What exactly is the information highway as touted by the Clinton Administration? Does this technology broaden or narrow access to information? Are there significant barriers that might limit an individual's access to information? How might it impact education? How much will access vary from school to school? What will be some of the ethical dilemmas presented by this new technology?

Our obligation

In September of 1993, the White House announced a plan to establish the Internet as the starting point for the National Information Infrastructure. The Clinton administration has touted the National Information Infrastructure as an "information highway" that will redefine communications. As educators and administrators, we are obligated to become more informed of these electronic possibilities so that we may avoid the potential downfalls associated with them.

The audio-visual media—radio, television, and films—broadened access to information by making it cheaper and less demanding of skills, but reduced the opportunities for public input since the information was primarily limited to the presentation of information to a passive public. Telecommunications, on the other hand, offers the ability of information *exchange* allowing the public to become active participants in the flow of information. The role of the decision-maker is quickly changing—no longer is he or she shielded by clerical workers and staff. Those once inaccessible now can be reached directly via an e-mail address or a fax number.

continued on page 3

"Intellectual honesty is a fundamental value in education. It includes respect for the intellectual creations of others. The onslaught of computers in our lives has not changed the rules, but it is putting our values to the test by making it easy to appropriate the works of others. While laws and policy condemn and ban such activity, in the world of computers it will be individuals who decide the issue."

Frank Connolly
The American University
"Intellectual Honesty in the Era of Computing"
T.H.E. Journal
April 1995

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Linda H. Fleit

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR017736

BEST COPY AVAILABLE

NEWSBRIEFS

A RESOURCE FOR COMPUTING IN THE ARTS AND HUMANITIES

Sponsored by PEINet (Prince Edward Island, Canada), CHORUS is an on-line, hypermedia resource for academic and educational computing in the arts and humanities. Targeted primarily toward academics, educators, information professionals, and students in higher education, CHORUS is a collaborative venture which brings together an international team of academics and professionals. It features essays, reviews of software of special interest to academics and educators in the humanities, and links to humanities-related resources on the Internet. CHORUS is accessible on the World Wide Web at http://www.peinet.pe.ca:2080/Chorus/home.html.

Academics, educators and information professionals are welcome to join CHORUS as section editors, reviewers, or editorial consultants. Software and book publishers may submit copies of their publications for review. For details, contact Todd Blayone, Project Coordinator, McGill University, Montreal, Canada at chorus@bud.peinet.pe.ca.

THE INTERNATIONAL COMMUNITY COLLEGE

The League for Innovation and Jones Education Networks have signed an agreement to explore the development of The International Community College, a worldwide extension of the community college concept through distance learning. Using satellite, cable, and emerging technologies, including interactive CD, the College will develop a broad range of learner-centered scheduled and on-demand educational programs and services in multiple languages. It will include an on-line learning center, student support services, portfolio assessment and credit validation, assessment services, networked library services, and electronic services to permit student interactivity with instructors, classmates, and an educational service center.

For more information, contact Terry O'Banion, Executive Director, The League for Innovation in the Community College, 26522 La Alameda, Suite 370, Mission Viejo, California 92691; (714) 367-2884.

NATIONAL EDUCATIONAL COMPUTING CONFERENCE

NECC '95, "Emerging Technologies and Lifelong Learning," will be held this year at the Baltimore Convention Center on June 17–19. Hosted by Towson State University, the conference will emphasize new ways of teaching and learning using information technology. In addition to regular conference sessions covering topics such as teaching with technology in higher education and virtual communities, there will be a series of presentations and demonstrations by the recipients of awards from the Division of Undergraduate Education of the National Science Foundation, representing the fields of biology, chemistry, computing, mathematics, and physics.

For more information, contact the NECC '95 Office, Towson State University, Baltimore, Maryland 21204; (410) 830-2773; necc95@toe.towson.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@MCIMAIL.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Telecommunications Issues in Higher Education ...

continued from page 1

It should come as no surprise that new technology offers both advantages and disadvantages. Unfortunately, when we fail to consider some of the negatives involved with change, we often neglect to prepare ourselves for the eventual impact these negative outcomes might have. Our obligation as information technologists is to identify and describe issues relevant to telecommunications and education so that they can be considered, discussed, and resolved.

Obviously, the advent of computers following World War II has significantly impacted our society, but telecommunications opens a new world of information access and exchange. The Internet, established in the mid-1960s as a way to provide communication alternatives to telephone, radio, and TV for military purposes in the event of hostilities with the Soviet Union, is adding a million users every month.

Information and Democracy

In a video titled "Counting on Computers," Walter Cronkite argues that computer use by its very nature leads to the development of a scientific autocracy—a threat to democracy that can be countered only by fostering greater scientific literacy at every level in our schools. As Ralph Nader has said, "Information is the currency of democracy"; it is generally accepted that information is the source of knowledge and knowledge is the source of power. Within a democracy it is imperative that the citizenry have free access to information so that a government run "by the people" can be run "by an informed people."

There are essentially two aspects of information within a democracy: the people's right to know and their rights to privacy. Unfortunately, these two issues can be conflicting and are often misunderstood. Educators and administrators should have a working knowledge of both issues for their own protection; the Freedom of Information Act (1966) and the Privacy Act (1974) address these issues directly.

> ***When we fail to consider some of the negatives involved with change, we often neglect to prepare ourselves for the eventual impact these negative outcomes might have.***

The Freedom of Information Act (FOIA) was passed in 1966 to assist the public in obtaining information from government agencies. Amendments have since been added that have continued to facilitate this information access to the public. With the passage of the FOIA, the burden of proof passed from the individual (who previously had to justify a "need to know") to the government (who now recognizes that the individual has a "right to know"). The FOIA applies only to documents held by administrative agencies of the executive branch of government; there is no right of access for the public or the press to judicial or other governmental proceedings.

In 1974, the Privacy Act was passed by Congress. The Privacy Act is intended to provide individuals the ability to acquire information about themselves and to prevent disclosure of this information to others. This act gives the individual significant control over how information about him- or herself is used. It requires consent prior to the release of information about him or her and prescribes that no secret record systems are to be kept on individuals.

Ethical Dilemmas

Educators and administrators are particularly affected by ethical dilemmas that come about from the application of these two pieces of legislation. There are specific rights of protection provided by the First, Fourth, Fifth, and Sixth Amendments that raise important issues for consideration.

The First Amendment says that Congress shall make no law abridging the freedom of speech, or of the press, or of the right of the people to peaceably assemble. Relevant to the freedom-of-speech issue, telecommunications provides a broader range of access for expressing one's thoughts. Knowing President Clinton's e-mail address, for instance, I can advise him on issues of international significance. He can't stop my electronic mail from reaching him regardless of what I might offer as advice nor can I stop the potential onslaught of commercial "junk mail" that might be created as a result of the NSF removing commercial restrictions from the Internet. Will there be some balance between freedom of speech and freedom to ignore everyone's else's speeches?

continued on page 6

David Ayersman is an assistant professor at SUNY College at Plattsburgh. Daniel Anderson is at West Virginia University. This article is excerpted from their presentation at the 1994 ASCUE Conference.

Good Client Seeking Good Co

by John G

Everyone knows the joke about the consultant who borrows your watch and then tells you what time it is. It's a good joke, but the real joke is that the joke is not a joke at all: it's a good definition of consulting. It's the way consulting is really done—not the bad kind of consulting, but the good kind.

The good kind of consulting is when the consultant actually listens to the client and actually goes to the trouble of looking at the client's watch; the bad kind is when the consultant comes to the project with The Eternal Right Time and The Prepackaged Right Answer.

For good consulting, you need a good client, a good watch, and a good consultant.

Of course, the best kind of consulting happens when the consultant has a really good client. That sounds silly but it's true. It's reminiscent of that sage observation of a Georgia governor in the 1960s who, responding to a reporter who asked when Georgia would have better prisons, said that Georgia would have better prisons "when we have a better class of criminals." Has anything truer ever been spoken?

And so the consultant's first task is to find a good class of clients, which of course raises the question: What makes a good client?

The easiest way to approach that question is to ask its inverse: What makes a bad client? The answer is that a bad client is someone with a deep emotional need for a bad consultant—as in those books with titles like *Good Women Who Love Bad Men* or ... well, you know all the variations. Anyway, a bad client is a wounded person looking for a Fixer who bears the Secret Formula for painlessly remedying all of the client's problems.

Well, there's good news and bad news for a bad client.

The good news is that the Secret Formula will be provided.

> ***Bad clients are ones who take no responsibility for their own salvation. They want to be delivered, but instead of being delivered, they are taken.***

The bad news is that it will be provided by a Bad Consultant.

Although there are a bewildering number of Secret Formulas, at least they're all short and easy to memorize. In fact, most of them take the form of a single word or phrase: "IBM!", "Macintosh!", "Novell!", "Unix!", "Postscript!", "Mosaic!", "Internet!", "Client/Server!", "Firewall!", "Warsau!", "Buggabugga!" and so forth. (Don't forget the exclamation point! We're talking now about Secret Formulas!)

I happen to know dozens of Secret Formulas but I'm going to continue to sit on them, because that's what intellectual property is all about. However, I'm willing to tell you this much: today's Secret Formula is "firewall"—with "buggabugga" a close second. I'll also reveal that three other Secret Formulas waiting in the wings are: "All slogans are right"; "All slogans are wrong"; and "All slogans are potential book titles."

In my early years as a consultant ("Gehl's Blue Period," as those years are characterized in my scandalous and unauthorized memoirs), I did some work for a fellow consultant who specialized in organizational studies for very small nonprofit organizations receiving federal aid. The consultant's M.O.—"M.O." is consulting talk; if you're not a consultant or a criminal you might not be familiar with it—was to arrive at the client's tiny basement office in some little Southern town, ask for the client's organization chart and official policy ringbinder, and return to his room at the Holiday Inn to draft the final report. The final report would (surprise!) record the consultant's most well-thought-out and professional finding that the client organization was remiss in having neither an organizational chart nor an official policy ringbinder.

After observing this process a number of times, I asked the consultant for a copy of his own organization chart and official policy ringbinder, though, of course, the consultant had no such things. Needless to say, he laughed. I laughed, too. So there we were, the two of us sharing a hearty, conspiratorial laugh, as we were polishing up a final report recommending that the client's two- or three-person organization was in critical need of an orga-

---

John Gehl is editor and publisher of Educom Review.

ısultant for Adult Relationship

ıl, Educom

nization chart and an official policy ringbinder.

Oh, well. Everyone was happy. The client was happy to get a nice new ringbinder and renewed federal funding; the consultant was happy to have his insights rewarded with attention (and $$$); the feds were happy to have a report to file away; and I was happy for The Experience. (Of course, that was then and this is now; I've had quite enough Experience, thank you.)

I've sometimes wondered whether or not the ringbinders actually helped. Maybe they did. If nothing else, I'm sure they added a certain elegance to the client's bookshelves. However, I don't think the new organization charts helped much —except as comical demonstrations of the manic resourcefulness of people forced to perform absurd bureaucratic exercises. In fact, the organization charts produced by the executive directors of those tiny organizations were works of art ... with dotted lines, boldface lines, lines with bi-directional arrows, lines composed of dollar signs, etc., etc. The variety and quality of draftsmanship was truly amazing to behold (and this was even before the days of color copying and desktop publishing!).

But these weren't bad clients; they were brave and admirable survivors, who had enough sense to know that when things get crazy you need to look to your deepest inner self—and find The Craziness Within. Craziness then becomes a sign of responsibility.

In contrast, bad clients are ones who take no responsibility at all for their own salvation. They want to be delivered ... but instead of being delivered, they are taken.

Bad clients want to be delivered from everything except project administration—a subject in which they exhibit a pathological interest—and talk incessantly about "holding the consultant's feet to the fire."

I'm happy to report that I have no direct knowledge of this strange phenomenon involving feet and fire. I've never personally experienced it with regard to my own feet or witnessed it with regard to other people's feet, so I have nothing to tell you about it. For all I know, it may not exist, or it may be an everyday outdoor ritual, performed by crazed campers around their campsites, somewhere out in the woods. Fortunately, I don't spend much time out in the woods.

If you can't understand and believe that this client is a special case, then you're the wrong consultant for the job

In any event, the principal characteristic of bad clients is that they have low expectations and high demands. They want simple answers to complex problems, and they desperately want someone to blame (a consultant, a politician, a serial killer, it doesn't really matter, as long as it's someone besides themselves).

The good client is exactly the inverse of the bad client. Whereas a bad client is someone looking for an unhappy relationship with a bad consultant, a good client has a genuine interest in explaining his or her problem to an intelligent outsider. And a good consultant is essentially nothing more than a good listener. No Secret Formulas or Magic Potions—just an ability to ask questions and (this is the miracle) actually listen to the answers.

One of the reasons that the consulting process (when it works) is miraculous is that the client and/or the client organization is usually operating at cross-purposes. (Or why else would it need a consultant?) And so listening to a client is like listening to a symphony or an opera: you need to hear more than just the tunes. You need to hear the orchestration, feel the drama, understand the motivations of the characters.

And if you can't understand and believe that this client is a special case, then you're the wrong consultant for the job, because the client doesn't want or need to hear your recitation of platitudes. The client wants coaching. The essence of coaching is to give specific corrective advice to specific players. This is also the essence of good consulting.

Well, I could say a lot more about this, but I think I've used up my time—though I'm not really sure about that, because my watch is in the shop.

What a nuisance. Do you suppose I could borrow yours? ■

Telecommunications Issues in Higher Education ...

continued from page 3

Regarding the freedom to assemble, the potential to gather *en masse* is an obvious advantage of telecommunications. I heard recently of a course offered on the Internet that was attended by over 1700 students from around the world. Will this right be in jeopardy as gatekeepers decide who gets access to the network?

And in terms of freedom of the press, despite the fact that the press is charged with the duty of informing the people, votes have been cast on the basis of media-controlled information to the public that has not represented the entire issue. Less control over the information might be one advantage of computer networking. Sorting out the truth from the opinions might be the downside of this however.

The Fourth Amendment guarantees the right of the people to be secure in their persons, houses, papers, and effects. But there is practically no security against computerized invasion of one's electronic communications. Using someone else's password or address can enable someone to move about with an electronic "disguise" that would be the envy of James Bond. I can access information belonging to others just as easily as others can access mine. Government agencies are no exception. The NSA, FBI, FCC, and possibly the CIA are all capable of monitoring the Internet. There are apparently no restraints preventing this round-the-clock observation. Will Fourth Amendment violations become a problem? Will the Fourth Amendment apply to government's virtually undetectable intrusions via telecommunications?

The Fifth Amendment states that no person shall be deprived of life, liberty, or property without due process of law; nor shall private property be taken for public use without just compensation. But what constitutes property within the realm of telecommunications? Software is made up of binary code and Boolean logic that is further complicated by units of information so small (bytes) that there is no clear solution to defining property or establishing ownership. Telecommunication involves passing rough drafts and raw forms of materials across great distances in a timely manner inconsistent with the old-fashioned copyright and patent processes. How will we ascertain when property has been taken for public use without just compensation?

> *There is practically no security against invasion of one's electronic communications. I can access information belonging to others just as easily as they can access mine.*

The Sixth Amendment guarantees that in all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the state and district where the crime was committed. The Internet involves sending information in multi-linear routes consisting of circuitous paths that cross state, district, and international boundaries in mere seconds without the knowledge of the sender or the receiver. Will telecommunications crimes be automatically classified as federal crimes because of this? If so, the seriousness of the crime would seem to be escalated simply because of the jurisdiction. How will the courts determine venue?

Access Issues

Information Organization. As on-line information repositories categorize, code, and sort in an attempt to meaningfully organize the information on hand, users will most likely continue to unintentionally exclude information from their search due to the organization of the information. Which words are to be used as keywords or subject headers to identify an article or book? On-line systems may exacerbate these problems as much more goes on behind the scenes and information is more narrowly defined.

Geographical Inequities. In the past, the public library system has responded to rural citizens' needs by taking the library to them (e.g., bookmobiles and branch libraries). President Clinton's government appears to be following the same approach by suggesting that downlinks and terminals will be available in public buildings for similar reasons. Most rural areas lack the resources found in urban libraries; making information available on-line creates the possibility of solving this crisis. But will rural areas have the same types of terminals as the urban areas? Will librarians or resource personnel have similar abilities of providing assistance at the two locations?

Socioeconomic Disparities. Telecommunications may prove to add the lack of information to the tribulations of the poor. The cost of accessing information via telecommunications and computers is higher than many citizens can afford. Many lack the ability to make use of these opportunities. Institutional access in the form of

computers in public libraries and universities may pose a solution but limiting information to a few isolated terminals forces the public to gain very specific access.

Physical Ability. The lack of ability or skill to use the media is recognizably another barrier to information availability. There are many groups of society that might have difficulty using telecommunications just as there are those that will become even more able. If mobility is a problem, telecommunications will enable more people to overcome it since they can gain access to information directly from their homes.

Legal Issues

There are many legal issues that arise as a result of telecommunications. When new technologies are evolving far more rapidly than the legal system can handle, there are bound to be problems. For instance, it is not difficult to mask one's identity by using someone else's account number or password. This creates issues of libel and defamation that the courts will have to address. Proving these deliberate acts will be difficult. There are copyright and licensing issues created by the ease of transmitting and making multiple copies of programs.

Specific professions will face their own ethical dilemmas as a result of telecommunication systems. Lawyers face issues of lawyer-client communication security, problems of nonlawyer access to the system, difficulties in abstaining from providing advice to clients outside their geographic area of expertise, and the anonymity of clients may result in conflicts of representation. One could extrapolate these problems to other professions—medical advice given by unqualified individuals and educators releasing grades to individuals other than students, for example.

It is possible that more people will use telecommunications to slander and misrepresent the truth. If the libelous information becomes the basis for decisions, I foresee a move toward a more litigious society as people seek recourse.

Summary

To make information available to all requires an infrastructure linking the many electronic sources and the enabling of individuals to use the new technology. The Internet begins to fulfill only one of the two requirements; the other remains to be addressed. Without adequate education or knowledge of how to use the system, there will be an inability to gather and organize the available information all around us. This will lead to a condition where, rather than benefitting, there will be specific groups of people who will suffer from a reliance on telecommunications. The needs of these groups must not go unnoticed. ■

"We are now in a period of time that is insistently re-inventing itself as something totally new because of information and electronic communication. The library has posed a special challenge to the freethinkers who would appropriate the library into a symbol of the dawning new age, merely by adding an adjective: electronic, virtual, new, information, digital, multimedia.... While there is no agreement as yet on the single best adjective, there *is* agreement that the library must itself be changed fundamentally if this self-consciousness about an information revolution is to be more than rhetorical labeling."

William Plater
Indiana University Purdue University Indianapolis
"The Library: A Labyrinth of the Wide World"
Educom Review
March/April 1995

In Future Issues

- *The QWERTY-Dvorak keyboard issue needs resolution*
- *"How Much is That Micro in the Window?" and "Have I got a deal for you!"*
- *IT's role in the National Quality Awards for higher education*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. One of our goals in computer services is to help end users become independent, especially in the area of report writing. Right now, we do all reports, sometimes in COBOL and sometimes using fourth-generation tools, depending on the application. Needless to say, our backlog is huge, and we're getting more complaints about service. It seems to me that we ought to be able to off-load at least the 4GL stuff to end users. Is this realistic?

A. *The direction is realistic (and desirable), but you need to keep several things in mind. First, some users will see creating reports as simply extra work that they are now responsible for (that you used to do for them). You need to be really clear about why it is in their best interests to take the time to learn new tools, learn the data structures, and actually do the work of producing reports. Second, not all users will have the skills necessary to take this on—despite all of our talk of "user friendliness," most report writing tools today have not reached that goal yet. It is unrealistic to expect that all users will have the wherewithal (including the time and the inclination) to be able to do report writing as well or as quickly as a professional programmer. Then too, not all users will have the right hardware and software to be able to do this conveniently. All in all, it's a very good idea to foster user independence, but you need to tread carefully.*

Q. We are just beginning our first information technology strategic planning effort. Are there certain overall goals we should keep in mind?

A. *The fact that you are doing this at all is a very good thing, and yes, there are some broad goals that would be useful to guide you through the process. Plans should: 1) be based on a wide appraisal of user needs done by the users themselves; 2) address user needs specifically, leading to an underlying technological foundation, rather than beginning with a specific technological platform and then fitting user needs into it; 3) be based on a full analysis of the costs and benefits of various alternatives; 4) have contingencies and a change process built into them; 5) be practical, doable, and affordable; 6) support institutional goals and objectives; 7) have a great deal of broad-based institutional support; and 8) be communicated to the entire institution, with regular updates.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse NY 13210

printed on recycled paper

THE EDUTECH REPORT

May 1995

Volume 11
Number 2

The Education Technology Newsletter for Faculty and Administrators

Hypertext: Hyperware, Hyperchondria, or Just Hype?

by Howard Strauss, Princeton University

It is not surprising that we'd want more than just text. Text has been around for centuries and we're bored with it. We have scratched it onto the walls of caves, chipped it into stone tablets, inked it onto paper, written it in the sky, and even beamed it onto cathode ray tubes and LCD screens. One flaw in all this text, the experts tell us, is that text is always sequential. Whenever text appears it has a beginning, middle, and end. Each word is like a car on a long train. And the cars move by in a fixed sequence. Even if one were bold enough to start reading text in the middle, there would be little choice but to continue sequentially from that point on, and one would always be painfully aware that the beginning had been missed.

Hypertext has been defined as more than text, as non-linear writing, and as the future of text. Before Ted Nelson coined the term "hypertext" and before Vannevar Bush[1] in 1945 wrote[2] about the hypothetical Memex with its association trail (which was functionally hypertext) was there simply no hypertext? Were people forced to read everything sequentially?

Of course not. Hypertext is not the future of text at all. It has been around for as long as text has been around and humans have gotten very adept at using it. Most of the trouble that we get into using it (and we get into quite a bit) stems from our failure to take advantage of the great body of hypertext knowledge we already have, and our failure to build on that base.

continued on page 3

[1] President Franklin Roosevelt's science advisor.

[2] In an article titled "As We May Think" in *The Atlantic Monthly.*

"The giddy promise for the future is that technology will provide us all with more information, under the premise that more is better. Doesn't anyone notice that there is no clamor for more information? The real wish is for less information but more relevant information in a more rapid and assured environment. That requires that we protect ourselves, and our clients, from the garbage."

Herbert White
Indiana University, Bloomington
"Is Anyone Still Training the Circus Animals?"
Library Journal
February 15, 1995

NEWSBRIEFS

NEW E-MAIL LIST FOR FACULTY USING COMPUTERS

Ted Mills, coordinator of the faculty resource lab at the University of Connecticut, has started a new list devoted to supporting faculty efforts to use computers in their work. According to Dr. Mills, "a large proportion of the faculty of each college and university is training itself to use computers in teaching, research and service. The magnitude of this self-training process can hardly be overstated, nor can the long-run consequences. We need a lot of support from our schools to accomplish it well. That support has to be systemic—college/university-wide, taking many forms, and available both at beginning and advanced levels over a long period of time. That's one part of what this list is about: mutual support among people charged with support of faculty in this computing-skills self-training process." The list is also meant to be a way of sharing specific needs, experiences, ideas, and resources for the day-to-day support of faculty self-training.

To subscribe to the list, send a message to listserv@uconnvm.uconn.edu with the message SUBSCRIBE FACSUP-L firstname lastname.

CAUSE REGIONAL CONFERENCE

The 1995 CAUSE Northeast Regional Conference focuses on a timely topic for higher education—the Open Software Foundation's Distributed Computing Environment (OSF DCE) standards. There are two conference options: the first is a two-day event (June 1–2) for those who want to learn more about DCE, and the second is a three-day conference (May 31–June 2) for those already committed to implementing DCE on campus and wanting more detailed and technical information. Both will be at the Penn Tower Hotel on the University of Pennsylvania campus and will include a mixture of tutorials, general sessions, presentations from early implementers, and demos.

This regional conference is part of the CAUSE Professional Development program, and is meant for anyone whose job requires the management, implementation, operation, or use of distributed computing on campus. For more information, contact CAUSE at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 449-4430; conf@cause.colorado.edu.

EDUCATION DEPARTMENT CHALLENGE GRANTS

The U.S. Education Department is offering 16 five-year grants, worth a total of $27 million, to groups of schools, colleges, and community groups interested in the use of computer networks to improve education. The grants will begin with the 1995-96 academic year. These are challenge grants, and as such, require that applicants demonstrate a willingness and an ability to make a substantial commitment to their projects' costs.

The deadline for applications is June 2. For more information, contact the Information Resource Center at the Education Department at (800) USA-LEARN.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@MCIMAIL.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Hypertext: Hyperware, Hyperchondria, or Just Hype? ...

continued from page 1

Did you notice a footnote two paragraphs ago? A footnote is hypertext. It facilitates a diversion from "normal" sequential reading to permit wandering off to learn an interesting, but often peripheral, fact or two. Reading a footnote is nonlinear reading. You can choose to read it or not. If you don't choose to read it, it is unobtrusively out of the way. Once you've read it, it is easy to return to your sequential reading.

That's the way hypertext ought to be. There should be some simple, universally recognized indication that there is a hypertext link and it should not interfere too much with regular sequential reading. For a footnote, a superscript number or character after a word does it. In most world wide web (WWW) browsers, an underlined or colored word indicates the hypertext link. Getting back from the diversion is usually easy too.

Another common form of hypertext is a table of contents. You might see a table of contents in a novel, but one is more often found—and much more useful—in a technical or reference book. But builders of electronic hypertext put just as many hypertext links in novel-like information as they do in more technical or reference material, cluttering otherwise readable text with many gratuitous hypertext links.

In a table of contents, each entry is a hypertext link. With a footnote we know to glance at the bottom of a page (or at the end of a chapter or book in the case of endnotes) and locate the number that matches the superscript on the referenced word. For a table of contents entry, we simply go to the referenced page number. As with footnotes, returning from a table of contents hypertext link is easy. Although we can read a table of contents sequentially from top to bottom—and we often do—like all examples of hypertext, a table of contents allows us to read things out of sequence.

The electronic hypertext equivalent of a table of contents is a menu or list of items. The page numbers are missing in electronic hypertext because the concept of pages is not relevant and you really don't care what page something is on, you just want to get there. Although the University of Minnesota's network browser, gopher, is not thought of as a hypertext system, like any other system that uses hierarchical menus, functionally it is. Like a table of contents, we often read a menu sequentially to see what's available. Then we select an item and follow the hypertext link.

> ***Hypertext is not the future of text at all. It has been around for as long as text has been around and humans have gotten very adept at using it.***

With WWW it is common to see a list of underlined hypertext links. Although WWW *cognoscente* won't admit to supporting something as archaic as menus, in fact WWW servers are rife with them, and that's a good thing. Because WWW is a hypertext-based system and menus are a common form of hypertext, gopher data maps very nicely into the structure of WWW. This is why gopher servers seem so familiar when accessed via WWW.

Indexes are another common form of hypertext. An index entry is like a table of contents entry except that instead of a single hypertext link it has many. For example, if the entry "Widgets" appears in a table of contents it will have a single page number after it, but if the same entry appeared in an index it might have many different page numbers after it. Today, such one-to-many hypertext links are rare. This is a case of one of the most useful forms of hypertext having no common electronic equivalent. How could such a mistake have been made? That is, unfortunately, only one of many.

Hyperchondria: An Abnormal Obsession With Hypertext ——
For more information on hyperchondria click *here*.

Have you ever seen a line like this on the web? It is ubiquitous. Is this how hypertext is supposed to work? Instead of linking from the word "hyperchondria," the link is from the word "here"? If we were going to put a footnote on this sentence would it be on the word "here"? Furthermore, lines such as these often appear in great gaggles, trying to hide the fact that they are really menus.

Years ago when laser printers and Macintosh computers first made fancy text processing possible, we were all awed by the new dimension this added to our writing.

continued on page 6

Howard Strauss is Manager of Advanced Applications at Princeton University.

BEST COPY AVAILABLE

A Low-Tech Obstacle t
The Keybo

by William Grass

Perhaps the biggest obstacle to widespread and effective use of computers in education and business alike is *not* RAM, ROM, MHz or bandwidth. Rather, it is QWERTY, that darn keyboard, which frustrates beginners and literally cripples experts.

Back in 1872, when the type-writing-machine was "invented," Shoales and Company laid out the keyboard intentionally to make one type slowly, lest the two-fingered typist jam up the hammers on this new-fangled contraption. A hundred twenty-three years later, the typewriter is gone, ten-finger touch-typing is in, but this contorted layout of the letters on the computer keyboard remains. The standard keyboard layout is immortalized with the name QWERTY, for the six letters on the top row of the left hand.

In 1936, efficiency experts August Dvorak and William Dealey realized the absurdity of this situation and redesigned the layout of the typewriters, but this new layout never really caught on for various reasons. Now it is becoming increasingly obvious that the lack of adoption of the "Simplified Keyboard" is perhaps the biggest obstacle to widespread computer literacy. And computer literacy is increasingly important in all aspects of our post-industrial society.

Few students in my university know how to touch-type and many are still positively afraid of computers. The keyboard itself accounts for a large part of that dislike of computers. Children now in elementary school and pre-school are beginning a lifetime of typing on a keyboard layout that will stunt their development and ruin their hands with years of use.

The Dvorak keyboard is elegantly simple: the five vowels—AOEUI—are under the "home" fingers of the left hand and the five most used consonants—DHTNS—are under the "home" fingers of the right hand. With this layout, 70 percent of typing occurs on the home keys and is evenly distributed between right and left hands. In terms of the distance that your fingers travel, the Dvorak typist will "let their fingers do the walking" *one* mile for every *sixteen* miles that a typical QWERTY typist travels in an eight-hour day of typing. "The quick brown fox jumps over the lazy dog" was never so easy as when Dvorak laid it out.

> ***Few students in my university know how to touch-type and many are still positively afraid of computers. The keyboard itself accounts for a large part of that dislike of computers.***

Dvorak, however, found out that it is hard to teach new tricks to "lazy dogs" or even to "quick brown foxes." He had a hard time promoting the new layout. The obstacles to the new keyboard were the costs of replacing machines and retraining typists. (Dvorak, by the way, also designed one-handed keyboard layouts for those with disabilities).

Fortunately, the computer keyboard allows us to be of both persuasions, QWERTY and Dvorak, though monogamously so. Simple and inexpensive modifications can make your PC or Macintosh dual-capable. Stickers are then laid over the existing keyboard with both the Dvorak and QWERTY keyboard clearly visible in different colors and sizes. The switch between the two layouts is accomplished through software installed on the computer. By adding shading to demarcate the fingering of keys, it is also possible to promote the passive acquisition of touch-typing skills.

No one need retrain, who doesn't choose to do so. No one, however, should be encouraged to learn QWERTY either. This way, everybody is happy, especially the children who, like my daughters (ages eight and ten) and their friends, will not be compelled to conform to this barbaric inscription technology. All of this could be accomplished at little or no additional cost.

Any typist who is experiencing excessive fatigue or repetitive motion disorders should consider switching to a Dvorak keyboard immediately. Back in 1988, I kicked the QWERTY habit with only four hours of practice with a typing tutor program and two weeks of my regular word processing to get back my speed and proficiency.

Dr. William Grassie is with the Intellectual Heritage Program at Temple University. This article was originally posted to the AAHESGIT listserv.

› a Higher-Tech Future:
ırd Problem

›, Temple University

The big payoff of Dvorak over QWERTY (assuming your keyboard isn't making you ill, in which case better health is the big payoff) is if you are just learning how to type for the first time. The learning curve for touch-typing on Dvorak is 50 percent faster than QWERTY. Even if all you aspire to is hunt-and-peck typing, the Dvorak keyboard will serve you far better. And it is so clearly a better option for high-speed typing.

And that's the clincher for me in our increasingly computer-stratified society (increasingly divided between the technological haves and have-nots), where education, whether it be in elementary school or university, often means dragging students to the keyboard for the first time. Bringing a first-time typist to a QWERTY keyboard is like teaching infants how to walk with snowshoes on.

Steven Jay Gould, the evolutionary biologist, uses the example of the QWERTY keyboard in his 1991 book, *Bully for Brontosaurus*. In a chapter entitled "The Panda's Thumb of Technology," he argues that what gets fixed in evolution, in nature and in culture, does not necessarily make sense over the course of evolutionary adaptation. Gould is fatalistic about our "indenture to QWERTY." In evolution, he asks, "why fret over lost optimality?" But you need not be so fatalistic about yourself, your students, and your children; the computer allows us humans to be both dinosaurs and mammals on the same keyboard, if not in the same person.

Every keyboard manufactured, every computer sold, every workstation in schools and business should be configured to offer the users the choice between QWERTY and Dvorak. The Dvorak Simplified Keyboard: 1) is easier to learn, 2) causes less fatigue, 3) results in fewer errors, and 4) offers more speed.

Sometimes, low-tech and low-cost are just right!

The final question that needs to be addressed, however, is the survival of the keyboard itself in our technological futures. Does the future of computing include a keyboard at all, or will our "writing" be in the form of dictation or video? Here we must consider not only the realm of technological capabilities, but also discuss the muddle of linguistic philosophy.

Every keyboard manufactured, every computer sold, every workstation in schools and business should be configured to offer the users the choice between QWERTY and Dvorak.

Why do we often write, even when we can use the phone? Why is the book "always" better than the movie (even though we enjoy the movie)?

Some philosophers argue that writing, among other things, is a kind of "iconic augmentation" of an otherwise entropic reality. Writing and reading provide a semiotic simplification which makes reality more intelligible by its ability to focus our thoughts and set free our imaginations.

For instance, digitized video and audio can embody imagination, but it is quite another thing to express the concept of "imagination." The technology of language, especially written language, is enormously powerful through its capacity to productively organize a meaning-filled life.

Computer-Mediated Dictation may be an option for the technologically privileged in the not-too-distant future, but probably not in time for the Hal-type interface of *2001: A Space Odyssey*. Dictation, however, has always involved creative transcription by secretaries or authors. Even with the possibility of direct oral transcription by a computer, this technology of inscription will continue to require extensive editing by somebody via some kind of keyboard.

So however exciting the gee-whiz effects of the new hypermedia and virtual reality, the real of work of intelligence, discovery, invention, and meaning will continue to be mediated through the inscription of language. I'd place my bets on a long life expectancy of writing and therefore, of the keyboard as well.

So I end this piece as I began, by cursing that darn QWERTY Keyboard and extolling the virtues of the Dvorak Simplified Keyboard. This low-tech, low-cost solution to a big-time computer problem holds real promise for a more technologically accessible, healthy, and efficient society. ■

BEST COPY AVAILABLE

Hypertext: Hyperware, Hyperchondria, or Just Hype? ...

continued from page 3

"Wow," we collectively gasped, "we now have 64 fonts instead of just one!" And each of us, having these 64 wonderful fonts, felt compelled to use every one of them on every page of every document, making every memo that crossed my desk during this period look like a ransom note. Soon most of us learned that using our expanded quiver of fonts sparingly was actually more effective than hurling as many as we could at every document. But we have not yet learned this lesson with hypertext.

A quick glance at WWW servers will reveal that most web page designers are still on the very beginning of the hypertext learning curve. It is hoped that they will soon learn that: 1) making nearly every word and phrase a hypertext link is not helpful (imagine a footnote on every word of a document); 2) a hypertext link should take the reader to someplace useful and expected (a link from text about Lincoln's Gettysburg address should not take you to a discussion about some of the latest features of Ford Motor Company's newest Lincoln automobile); 3) disguising a menu as a paragraph does not make it a paragraph nor does it improve its readability (menus are ok in WWW); and 4) it was intended that when a footnote was read, the reader would return to finish the interrupted sentence, not launch off into cyberspace never to return.

With respect to that last point, with a footnote, you read sequentially, go off and read the footnote, and then come back to finish the sentence that was interrupted by the footnote. With most electronic hypertext links, we have lost sight of the idea that we might want to continue with the story once we have gone off to read a footnote or followed a hypertext link. If footnotes were done the way most electronic hypertext is done, we'd be reading along and in the middle of a sentence we'd spot a footnote. We'd stop reading that sentence and start reading the footnote. In a sentence in that footnote would be another footnote which we'd go off and read until we found another footnote which we'd go off and read. We'd never finish reading the original sentence and, in fact, would leave many sentences half-read. It is not surprising that many people who read electronic hypertext long for a map or something that will give them a clue as to where they are and where they've been. But the solution is not to hand a lost person a map. The solution is to produce documents that do not get people lost.

> *Each of us, having these 64 wonderful new fonts, felt compelled to use every one of them on every page of every document, making every memo that crossed my desk during this period look like a ransom note.*

Hypenotism: Being En"trance"d by Hypertext ___

An often-repeated myth about hypertext is that it frees you to read a document the way *you* want, instead of the way imposed upon you by the author.

Is reading text from start to finish imposed upon you by the author? Is this a bad thing? An author starts out gathering bits of information and struggles to organize the information into some coherent, logical format. The order that an author puts things in represents added value, not an imposition on the reader. You could read the last chapter of a mystery novel first (and some people do), but an important part of the story is the order in which things unfold. Even in a textbook, an author decides on some logical way to develop the information. Information on Ptolemy might come before that about Copernicus which might be followed by the theories of Galileo. Quasars and pulsars would be left for a later chapter.

Of course any good textbook will contain footnotes, indexes, and tables of contents. All of these are hypertext links that let you read things out of order, but they, like nearly all hypertext links, are designed by the author. The idea that you can cruise along hypertext links of your own choosing, ignoring what the author intended, is rarely possible and rarely very useful. The fact that hypertext links must be consciously added to a document means that you are constrained to use just those links the author (or the author's surrogate) chose to provide. While the author might not be able to tabulate all the ways you might traverse the hyperlink highways that he or she builds, there are few (if any) off-the-road vehicles that let you travel via a link that isn't prebuilt.

In most cases and especially in electronic books, hypertext is added after the document is done. This is exactly the wrong time to do this. An author starts with small facts, organizes them, and puts them smoothly together in an article or book. Then, someone who usually hasn't a clue as to how the infor-

mation was put together from its early components, attempts to link related pieces of the work together. It is not surprising that this is almost always done badly.

The insane thing about this is that there is a time when hypertext could be added easily and effectively. It is at the point where the author has his or her facts together but has yet to establish the order of them. Then, as the author is looking at all the facts and trying various ways to link them it would be easy for the author to build links that would make sense. In fact that is exactly what the author is mentally doing.

"Let's see. I could put this stuff about Siberia right after the interview with Joseph Feinstein or I could put his escape to America first", is the kind of thing an author might be thinking. The author is actually considering alternative hypertext links. For a real hypertext book, the book would never really be put together. Instead, the facts would be gathered and the author would build many hypertext links joining them. Yes, the author might give you a suggested way through the information, but you'd be free to read it many other ways.

Just Hype?

In the past we learned how to use footnotes, tables of contents, and indexes effectively, but in our electronic formats we seem to have forgotten all of that. We use too many hypertext links, use them where they make no sense, ignore the difference between footnotes and tables of contents, build links to bizarre and unexpected places, ignore standard ways of linking, and confuse, rather than enlighten, with hypertext structures that make bowls of spaghetti seem like models of good organization.

We also need to implement new standards and features for hypertext, such as a real hypertext footnote and a way to distinguish a hypertext footnote from a hypertext link; a way to do hypertext index entries; and a better way to establish links from images, sounds, movies, etc.

Is hypertext just hype? No, it is an important and vital way of structuring information that we will likely use more every day. But in making the leap from printed hypertext to electronic hypertext we have often failed to learn the lessons of the past and to take advantage of the new technology now available. That does not have to be the case. Hypertext is just another tool with which we can manipulate information. It has been around for years and we have done wonderful things with it. Now in its electronic incarnation it is new, improved, more powerful, and more confusing. But as with many other tools, we can use hypertext to make a monstrosity or a Mona Lisa. ■

"Studies by individual faculty of their own students and their own teaching methods and resources are necessary. But such studies are not enough. I suggest the following hypothesis: Education can affect the lives of its graduates when they have mastered large, coherent bodies of knowledge, skills, and wisdom. Such coherent patterns of learning usually must accumulate over a series of courses and extracurricular experience. Thus, to make visible improvements in learning outcomes using technology, use that technology to enable large-scale changes in the methods and resources of learning."

Stephen Ehrmann
"Asking the Right Questions: What Does Research Tell Us About Technology and Higher Learning?"
Change
March/April 1995

In Future Issues

- *"How Much Is That Micro in the Window?" and "Have I got a deal for you!"*
- *IT's role in the National Quality Awards for higher education*
- *Strategic budgeting must accompany strategic planning*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We're trying to develop our plans for desktop micros for the next three years, but we're hampered by the divisions in our planning group. Some think everyone should have a microcomputer of some kind; others think we can get by with dumb terminals for a lot of folks. Even if the latter position is correct, how long can we expect to be able to do this?

A. *We have to come down on the side of micros for everyone, as soon as possible. There are two main issues. The first is the rapidly increasing usefulness of microcomputing at all levels of an organization. There was a time when many of us believed that while micros were certainly appropriate on the desks of "knowledge workers" (executives, faculty, professionals, researchers, etc.), the desktop intelligence and power was not usually needed on the desks of support staff. We quickly saw the fallacy in this thinking with faculty secretaries, who, if they are truly going to assist in making the faculty more productive, need to have as least as powerful and versatile a computer as the faculty member(s) they are supporting. We are now seeing the same fallacy used on the administrative support staff side. Micros are rapidly becoming as necessary a tool for doing our jobs—whatever those jobs may be—as a telephone. The second issue is the associated cost/benefit analysis. The costs of very powerful and capable micros are declining rapidly. With the extremely limited capability of a dumb terminal (not to mention the likelihood of dumb terminals being completely unusable in a graphical-user-interface and client/server world), and the relatively small incremental cost of acquiring a micro, it just doesn't make good economic sense anymore to acquire dumb terminals.*

Q. We're looking for a new administrative software system, and the vendors are telling us it could take as long as three years to implement a full system for the campus. How can it possibly take so long?

A. *It could be done in less time, but probably not much less. First, there is the complexity involved; today's systems are fully integrated and cover a tremendous amount of functions and purposes. Second, there is an "absorption rate" for the campus to cope with such a massive change—it's not just new software, it's a whole new way of dealing with information.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse NY 13210

printed on recycled paper

THE EDUTECH REPORT

June 1995

Volume 11
Number 3

The Education Technology Newsletter for Faculty and Administrators

Can Technology Save Higher Education?

by Martin B. Solomon, University of Utah

When people become quite good at doing something and find procedures that provide quality results, they tend to zero in on those methods and then use them regularly. This practice has led to a variety of slogans and phrases such as, "Don't get off a winning horse," or "If it ain't broke, don't fix it."

Higher education in the United States has had an exceptionally successful record. For example, U.S. scientists and professionals account for the vast majority of Nobel prize winners. The overwhelming record for the U.S.—206 prizes between the years 1901 and 1985, compared with the next largest number, 85, for the British—is certainly attributable to the extremely high quality of our higher education system.

Further evidence of the quality of U.S. higher education is the attraction to foreign students. According to the National Center for Education Statistics, from 1977 to 1989, the number of foreign students receiving Master's and Doctor's degrees in the U.S. increased by 96% and 105% respectively and foreign undergraduate degrees increased by 72%. Foreign student enrollments in U.S. colleges and universities show a similar pattern; foreign undergraduate enrollments increased by 21% and graduate and professional enrollments increased by 94%.

It has become a well-known fact that people who hold college degrees have significantly greater earning power than those without such degrees. So the success of higher education in reaching so many of our own citizens as well as citizens from around the world has been magnificent. Higher education has been one of the few uniquely outstanding products of this country.

continued on page 4

"It is not surprising that just one-half of 1 per cent of CD-ROMs are devoted to educational software in the humanities. Until recently, those of us who discuss works of literature, history, and philosophy with students in classrooms have felt little need to go beyond printed books. Now ... some of us recognize that this technology can extend what we do by easily (and inexpensively) juxtaposing text with art, photos, video, audio, and animation. Even instructors who never wander far from books have much to gain from software that, in effect, can create tutorials for students by helping them think more actively about books."

Leonard Rosen
Harvard University
"The Way to Design Creative Software for the Humanities"
Chronicle of Higher Education
June 2, 1995

NEWSBRIEFS

BUSINESS SCHOOL COMPETITION FROM TECHNOLOGY?

The Multimedia MBA, a CD-ROM from Compact Publishing Inc. and Richard D. Irwin Inc. is a complete, interactive management resource tool that includes advice, training, and applications for employees at all levels in small to medium-sized business organizations. Designed to help run retail, service, professional-practice, or not-for-profit organizations, the software runs under Windows and contains text, instructional videos, animations, photos, forms, and templates on a wide variety of business subjects. It also contains assistance for developing a business plan, learning the basics of accounting, and becoming familiar with legal matters. The CD-ROM is available in stores for about $80.

ELECTRONIC JOURNAL ON COLLABORATIVE UNIVERSITIES

The *Journal of Computer-Mediated Communication* has announced its inaugural edition, "Collaborative Universities," a special issue edited by Steve Acker from the Center for Advanced Study in Telecommunications, Communication Department, Ohio State University. Volume 1, Number 1 is on the World Wide Web at http://cwis.usc.edu/dept/annenberg/vol1/issue1. *JCMC* is a hypermedia publication; articles in this issue are accompanied by color photographs and diagrams, movies, and hyperlinks to other CMC-related resources. Readers may make annotations to the articles on-line.

Articles in this first issue include "Space, Collaboration, and the Credible City: Academic Work in the Virtual University," "Use of Communication Resources in a Networked Collaborative Design Environment," and "A Framework for Technology-mediated Inter-institutional Telelearning Relationships."

For further information, contact the editors at jcmc@usc.edu.

LATEST DIRECTORY OF LISTS AVAILABLE

The fifth and latest edition of the *Directory of Electronic Journals, Newsletters, and Academic Discussion Lists* has just become available from the Association of Research Libraries (ARL). The directory, which contains the addresses and information on how to subscribe for more than 2,500 Internet mailing lists, is available for $41 for association members and $62 for all others.

For more information, contact ARL's Office of Scientific and Academic Publishing, 21 Dupont Circle, Suite 800, Washington, DC 20036.

MORE COMMENCEMENTS ON THE INTERNET

Increasing numbers of institutions have made part or all of their commencement activities this year available on the Internet. Wheaton College in Massachusetts, for example, offered on-line event lists, full texts of speeches, pictures, and lists of graduates. Dartmouth College offered real-time audio and video of President Clinton's commencement speech there.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@MCIMAIL.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Getting the Most From the Software You've Got

by Arnold Dimond, Marymount Manhattan College

Today's economy and the competition for students is endangering the survival of many small colleges. That, added to the high demands on these schools' small computing staffs and the wide variety of tasks end users are required to perform, makes an easy-to-use and completely integrated administrative system crucial to the success of the institution. By performing administrative tasks as efficiently as possible with a fully integrated system, small schools can make productivity gains that are directly reflected in their financial results.

Many small schools installed administrative systems during the 1980s as the "thing to do." However, because of small staffs and a general lack of computer literacy at the time, these schools may not have taken full advantage of what their systems offered, nor kept up with new releases or upgrades. I found that to be the case at Marymount Manhattan when I joined the school in 1990. I was faced with a system the staff told me offered little benefit to the school. Having implemented two student information systems during my 33-year career with the City University of New York, I was brought to Marymount by a new president to help fix the many administrative and financial problems that had the school on the brink of closing. One of my first targets was the administrative system.

Marymount installed its system in 1980 for use by a staff with limited computer skills. After the system was installed and the users were trained, the staff began to use it without any consultation or coordination between offices. No one was responsible for overseeing the overall use and maintenance of the system, much less enforcing the policies and practices that would make its use worthwhile.

I contend many small schools may be in the same situation Marymount was in four years ago—they have a system installed, but don't know how to make it work for them. At Marymount, we reimplemented our system using the following process that can be applied to get more mileage out of any software. To date, we are seeing outstanding results.

> ***Many small schools currently may be in the same situation Marymount was in four years ago—they have a system installed, but don't know how to make it work for them.***

Step 1: Designate a "powerful" project leader. Most small schools don't have the resources available to form a committee to oversee the reimplementation process. However, a small school's reimplementation can be driven by one person, if that person is empowered to make decisions, establish policy, and enforce use of the system. This project leader must have an overall view of the school, its administrative system, and the end-users' needs. In addition, the project leader needs the support of the administration and the Board of Trustees to make decisions in the best interest of the school, as well as the trust and confidence of the staff who will eventually have to use the system.

Step 2: Understand what you have. My first step was to call in a representative from our software vendor to take me through the entire system, module by module, function by function. To my surprise, I learned the system was extremely easy to use with a menu-driven user interface and an integrated database structure that allowed for on-line, real-time operations: my overall goal for the system. In short, it was an outstanding system—better than any I had ever worked with.

Before deciding to reimplement your current system, it is imperative to understand exactly what your system is capable of doing and if it meets your current and future needs. Your vendor's representative can give you the best understanding of your existing software capabilities, as well as the hardware and peripheral equipment requirements for optimum performance.

Now is the time to rekindle a partnership with your vendor. A solid partnership is especially critical for small schools that need to rely heavily on the vendor for assistance, consultation, and training. Our partnership with our vendor was crucial to our success because of their product knowledge and educational support.

continued on page 6

Arnold Dimond is the vice president of administration and finance at Marymount Manhattan College in New York City.

Can Technology Save Higher Education? ...

continued from page 1

So Why Worry?

Because U.S. higher education has enjoyed such success, it is difficult for people to think that anything is wrong. But look back to IBM in 1987. IBM was riding high. It was number one in personal computers and number one in mainframes. Some of IBM's customers started telling them that the prices were too high and that it was becoming more unmanageable to afford IBM's systems. But IBM replied that those people simply did not understand—IBM's quality was unsurpassed and that the quality was well worth the additional cost.

As time went on, IBM's competitors began developing computer systems which were significantly less expensive, just as powerful, and seemingly as reliable; in other words, competitors were delivering comparable quality but at significantly lower prices. Still IBM proclaimed that the competition was just not up to the task.

Then one day the customers did not show up! IBM suffered the first quarterly loss in its history and slid deeper and deeper into confusion and disarray. How could this have happened? IBM was the most respected company in the world. Every management class used IBM as a model. IBM's practices were envied and emulated worldwide. What was the failure?

IBM didn't listen! IBM had been so successful that its leaders could not believe that the fantastic success that had served them well from the 1930s until the 1980s would not continue to serve them in the future. The president of IBM told the employees that if they only sold harder as they did in the old days everything would be OK. There was not a realization until very late that the industry had changed structurally.

Is Higher Education Far Behind?

Today, parents, legislators, and others are complaining that the prices are too high and that it is becoming more unmanageable to afford a college education. Higher education officials reply that those people simply do not understand—higher education's quality is unsurpassed and the quality is well worth the additional cost.

> *There are several forces at work that will tend to radically change higher education as we know it. The public is angry about the high costs and will likely take steps to deal with it.*

There are several forces at work that will tend to radically change higher education as we know it. The public is angry about the high costs and will likely take steps to deal with it.

Force 1: Legislation On Teaching Loads

The public's perception of higher education faculty is quite poor. Some are calling the faculty *The New Elite* in our country. Many see faculty as working six hours a week and "playing in the lab" the rest of the time. At least one state has already passed legislation that requires community college faculty to teach a minimum of five courses. Legislation in other states is pending that would make minimum teaching loads mandatory.

The truth is that this varies greatly among institutions, but at major state universities and large privates, the normal teaching load is six hours a week. And this is not normally dependent upon the level or quality of research being produced. Research productivity does not affect teaching loads as much as promotion opportunities. So the public sees faculty who produce little or no significant research still teaching six hours a week and consider that to be disgraceful.

While it is not unusual for faculty at community colleges and smaller four-year institutions to teach five courses a semester, it is the larger of our institutions that have received the most attention.

Force 2: Legislation on Tenure

As U.S. industry has had to shed the notion of job protection, there is growing hostility to the idea of a lifetime job. Faculty might be the only protected class remaining and the public cannot see why higher education should possess such a unique inestimable perquisite.

Until recently, higher education took it for granted that tenure was required and that the public understood. That seems not to be the case. The state of South Carolina has offered a bill in the 1995 session to forbid tenure to all future faculty and to abolish all existing tenure over some period of time. With the high level of anger present in our society today, it is likely that some state will soon pass such

Martin Solomon has just assumed the position of Special Assistant to the President for Information Technology at the University of Utah.

legislation and this will precipitate incredible change in the present system of higher education. The main change will involve the hiring of more part-time faculty or short-term faculty with higher teaching loads.

Force 3: Cheap Imitations ____ Gerhard Casper, the president of Stanford University, is concerned about cheap imitations of our very high quality services. As he said in a recent article in *The Chronicle of Higher Education*, "Unless we make the case for our work in its entirety and pursue it rigorously and effectively, the world may tire of us and develop new approaches that it will consider adequate substitutes."

For some years now an audiotape program called "Hooked on Phonics" has been making the scene as a program to improve substantially the reading ability of a typical youngster. It may or may not live up to the claims but it is, nevertheless, very popular. It is not very expensive, and for many children, especially those having difficulty with school-based reading methods, it is a viable alternative to private tutors, special schools, etc. It may even be an alternative to public elementary schools.

If you consider that the cost of a residential semester at a typical state university costs a student (or his or her parents) about $1,000 for tuition, $1,500 for room and board, and another $500 for incidentals, that amounts to about $600 for a three-credit course. Can people produce videotape courses that can be viewed at home for a lot less? Of course. Can they convince the public that these are equivalent to the interaction that takes place on the campus and in the classroom? That remains to be seen. But we know that many will try.

Force 4: A Less Receptive Student _____ I do not believe that the average student today has the same attention span, the willingness or the ability to succeed at college work compared to cohorts of fifteen years ago. During the past two years, I have taught over 400 students. I first found that most would not read homework assignments through casual questioning at the beginning of each class period. The next semester, I decided to administer occasional pop-quizzes to encourage a more regular reading of assigned material. Having failed that, last semester I conducted a five-minute written quiz at the beginning of every class period for the first seven weeks of the semester. Even this did not receive the undivided attention of everyone.

When people feel their agencies are not responsive, then, out of a sense of frustration, they begin to review the operating practices and procedures to see if they can better manage the operation themselves.

My unscientific conclusion is that too many youngsters are unwilling or unable to perform the "traditional" work required to gain a college education. But this is not unexpected. Education is a value-added process. You transform a student with a particular knowledge and ability level into one with more knowledge and ability. This delta is the value added by the educational process. It is axiomatic that if the incoming quality level is poor then the outgoing quality level is likely to be poor as well.

Force 5: The Search for Simple Measures of Quality ___ When people feel their agencies are not responsive to their demands, then, out of a sense of frustration, they begin to review the actual operating practices and procedures to see if they can better manage the operation themselves. This is what legislatures are beginning to do regarding their state colleges and universities. Naturally, if you are to control some process, you must be able to measure the results.

But educators have known for decades that nobody can easily measure the results or outcomes of higher education. Even if you could measure them, people would not agree on the efficacy of the results. For example, if you found that a student became more worldly in thinking, some would view that as positive and others as a negative.

In an effort to find simple measures of quality, legislators and commissions of higher education have come up with the incredible and astounding theory that graduation rates somehow measure the quality of higher education. So now we see institutions being "graded" according to graduation rates. But there are many problems with this. First of all, no one can accurately measure graduation rates. Some students transfer to other schools and then graduate. Some students drop out for child rearing and finish later. Many Mormon students regularly interrupt their college careers to participate in "Missions" and finish later. These are all currently counted as dropouts.

continued on page 7

Getting the Most From the Software You've Got ...

continued from page 3

There's always a chance that, after a thorough study of your system, you might find it is truly obsolete and must be replaced. Over time, many vendors phase out particular releases of their products, forcing clients to re-license a whole new product to get new features and functions. We were fortunate our vendor is one of those who keeps up with the marketplace, providing upgrades and new releases to installed clients as part of a continuing maintenance agreement.

Step 3: Train, retrain, and cross-train. Most vendors offer a wide variety of courses for project managers and end users. As the project manager at Marymount, I took more than 90 percent of the courses our vendor offered, from overall system perspectives to detailed classes on specific modules and topics. That's how I learned how the system works, as well as gaining a better understanding of the concerns that users from other small colleges face.

Once I was comfortable with the system, it was time to train the staff. Because of employee turnover and the years that had passed since the initial education was offered, everyone needed training. To encourage participation and buy-in, I attended the classes with my staff; this was not so much to enforce attendance, but to work with them to develop an understanding of what we were trying to accomplish with the system.

We also cross-trained our staff so, in addition to classes most pertinent to their day-to-day jobs, they took classes not directly related to their responsibilities. For example, we had a financial aid officer attend a registrar's class, a registrar attend an accounts receivable class, and so on. The classes gave everyone an appreciation for how the different pieces of the system fit together, what processes other users required, and the advantages of on-line, real-time processing.

Step 4: Allow time for transition. Despite the relative pervasiveness of computers in society these days, some people are still uncomfortable with one on their desk. In fact, during the process of reimplementing our system, several employees left the school rather than learn how to work with the computer. The process of training was slow and involved a great deal of patience and persistence.

To help ease the transition of the die-hard pencil pushers, we expected and planned for a temporary loss in productivity as people began working on the system while keeping parallel records. As users gained more experience and began to trust the system, we gently pushed them away from keeping written records and toward total computerization. Over time, more and more people became excited about the system's capabilities and even began making suggestions for other ways to use it.

Step 5: Prioritize pieces of the project. Reimplementing something as complex as an administrative system requires a significant amount of planning and time. Since it is impossible to reimplement a system of this size all at once, we prioritized which pieces were critical to have in place first. We also took into account the users' willingness and ability to make a successful transition to the system.

Using the college calendar as our guide, we scheduled implementation of different modules according to the timeframe in which they were most important. For example, the registration module was implemented at the beginning of a fall term and the financial modules at the beginning of a fiscal year. As we continue to roll out the system, we balance the functions of one module against another to ensure dependencies between modules are met and maximized while remaining flexible to respond to specific user requirements.

This prioritization process lets the computing staff operate primarily in a responsive (versus reactive) mode. As each module is scheduled to be reintroduced, it gives the team the opportunity to drive reengineering efforts that increase the efficiency and effectiveness of each administrative operation. The flexibility of our software allows us to customize modules to our specific needs, while maintaining the integration of the overall system.

Looking to the future

Our reimplementation project is running on target for completion. Seventy percent of the system is up and running, with the remaining portion scheduled for completion by 2000. Our strong partnership with our vendor continues as we prioritize and schedule further enhancements.

The reimplementation of our administrative system has made an extraordinary difference for Marymount. The productivity of our staff has increased dramatically and the services we offer to our students make use of the latest technology. After nearly shutting our doors in the late 1980s, today Marymount Manhattan College is looking to a bright future. While the turnaround at Marymount can be attributed to several factors, our ability to reimplement the administrative system to take advantage of an on-line, real-time operation gave us the tools we needed to make it happen. ■

Can Technology Save Higher Education? ...

continued from page 5

But most dropouts are caused by other reasons, including financial woes, drug, alcohol, and civil difficulties. It is probably true that a small number of dropouts come from poor teaching or an institution's uncaring attitude. But glomming onto graduation rates as a quality measure will inevitably encourage some institutions to "dumb down" the curriculum further.

Another problem relates to the evaluation of effective teaching. Easy evaluation methods are not at hand, so in an effort to find simple measures, many colleges and universities have used student evaluations as the primary, often sole, evaluation of an instructor. This can have a corrosive effect on the quality of instruction by encouraging faculty to opt for good evaluations as opposed to more effective classes. While often, quality teaching and good evaluations are highly correlated, holding to demanding and rigorous standards have resulted in many faculty receiving poor student evaluations.

Is Information Technology the Answer?

The pressures on higher education today are so intense that one wonders whether there is a way out. One thing is clear—the public will demand that tuition costs stop rising. That, in itself, will demand entirely new paradigms. What are they? How will they operate? Will quality education be possible in the new world of higher education? Will a more structured, rigid organization emerge? Will part-time faculty become the norm? Will most of college be taught by television? Will technical schools and community colleges flourish at the expense of megaversities?

These are all tough questions. But there is hope—and some answers —in the rapid incorporation of information technology into our colleges and universities. IT can make our institutions more efficient, thus potentially lowering the cost of delivering education. At the same time, IT can make our institutions more effective by delivering better education through a more personalized, interactive approach that responds directly to students' needs and styles of learning.

I believe that the new higher education community of the year 2020 will either use information technology in very new and different ways, or else higher education, as we know it, will die. Solving this dilemma will not be easy and it will take the cooperation of the entire university community to develop new paradigms and institute creative ideas. But most university personnel are so close to the trees that they cannot see the larger picture. The IT professional might have a special responsibility and opportunity here to play the role of Paul Revere in trying to inform the faculty, the administration, and, especially, the president that the "cheap imitations" are coming. Since the IT professional often has an earlier grasp on the future, he or she can play a vital part in helping to forge new directions, ideas, concepts, and paradigms. ■

"Why is the pace of innovation in higher education so slow? Why aren't institutions that fail to innovate at a competitive disadvantage?... It appears that colleges and universities are indeed insulated from many competitive pressures... Thus, top administrators often operate reactively. Their agendas are molded by whoever is sufficiently motivated to demand their attention. Short-run problem solving erodes the time available to focus on the 'big picture.' And administrators' ability to initiate change is constrained by the academic tradition of collegial decision making."

John Siegfried, Malcolm Getz, and Kathryn Anderson
"The Snail's Pace of Innovation in Higher Education"
Chronicle of Higher Education
May 19, 1995

BEST COPY AVAILABLE

In Future Issues

- *The importance of strategic budgeting*
- *You're never really educated without a smile*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We are dealing with insatiable demand—literally—for technology services and resources. Whatever our users receive, it isn't enough. This applies to microcomputers (this new micro is great, but there's a new generation coming out next week, and I want that one), use of the network (e-mail is great, but I want access to the World Wide Web), programming modifications (this change is great, but now I need a new report), and just about everything else. How do we cope with this without going nuts?

A. *Your institution is certainly not unique in this regard, nor is insatiable demand necessarily a problem in and of itself. The problem occurs when the institution has not devised mechanisms for dealing with the demand. You need to begin with the assumption that demand will always exceed supply, no matter how large or sophisticated or responsive the supply is; that's just the way life is right now. Then you need to have processes in place which can fairly and objectively evaluate the demands to see 1) if each one is "worth" satisfying and 2) which ones have to be taken care of before the others. In some cases, it is possible to increase the supply of the service or resource, but in most cases, it takes some hard thinking on the part of the institution—this is not an IT job!—to determine how to prioritize requests for services and resources. It can be done, many institutions are doing it successfully, but it takes real institutional commitment.*

Q. We are looking for a new MIS director. How can we be sure we will get the right one?

A. *By defining "right" correctly. The person needs to be every bit as skilled at communications and human relations as he or she is at technical and technical management work. Communications includes a very-well developed service orientation, dealing with a wide variety of end users, managing the programmers to derive maximum benefit to the institution, and feeling comfortable talking with anyone at the institution, including the President, the cleaning crew, the faculty, and other administrators. The talent for being a good technologist and a good technical manager is a wonderful one indeed, but if it is not accompanied by a parallel talent for dealing with people, it is worth far less to the institution.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

printed on recycled paper

8/1/95

THE EDUTECH REPORT

July 1995

Volume 11
Number 4

The Education Technology Newsletter for Faculty and Administrators

You're Never Really Educated Without a SMILE

by Howard Strauss, Princeton University

Most of the time if you are present when history is being made you don't know it. Usually the press doesn't realize it either. Did anyone ever see headlines that screamed "Vacuum Tube Invented! Talk Radio and MTV Bound to Follow Soon!"? Nope, most newspapers probably didn't even cover the story and those that did likely buried it on page D24.

But page D24 needs to be watched carefully. If you had looked there on Tuesday, April 4, 1995 in *The New York Times*, you'd have read that J. Michael Orenduff was forced to resign as chancellor of the University of Maine. If you missed that story, you missed as crucial an event in history as you are likely to ever experience.

Chancellor Orenduff was forced out because he wanted to create a virtual campus—a campus in which students all over the state could enroll without the expense or inconvenience of actually attending a university. Students would use the Education Network of Maine to take courses. The network has provided students with one-way video and two-way audio since 1989, but previously the network had just very limited use and generally could not be used to get credit for courses. Orenduff wanted to treat distance learning as the real thing! He'd even allow students on real campuses to get credit for taking courses on the virtual campus. A professor teaching a sought-after course would no longer be limited to teaching however many students could be crammed into the biggest lecture hall. The whole state of Maine, and possibly the whole world, would be able to attend the lecture. And instead of collecting $100 or so per credit hour from a hundred or so students, Orenduff stood to collect much more by charging less per

continued on page 3

"As we move into greater reliance on technologically based instruction, I think we need to keep track of results in ways people can get their minds around. I maintain that higher education must increase its learning productivity if it is to continue to enjoy public support (the alternative is either to decrease learning or drive up costs, either of which will undermine support). And if learning productivity = learning divided by cost, we need to find a way to track that learning in publicly comprehensible ways."

Peg Miller
Virginia State Council
of Higher Education
AAHESGIT listserv
June 26, 1995

NEWSBRIEFS

A NEW INTERNET SERVICE FOR ARTS EDUCATORS

A World Wide Web site for arts educators is scheduled to go on-line from the Getty Center for Education in the Arts in September, 1995. ArtsEdNet is one of only a handful of Web sites worldwide that focus on providing art resources to educators and is the only one designed for educators interested in the teaching approach known as discipline-based art education (DBAE). The new service can be found at http://www.artsednet.getty.edu/ on the Web.

The new interactive service will allow participants to communicate with each other, including recognized artists, historians, and educators. It will also provide access to curriculum materials, with more than 250 pages of free, well-developed lesson plans and other curricular resources that can be downloaded for use in the classroom. Information will be presented in full-color images and moving video clips, as well as in written text. For more information, contact Lori Starr at the J. Paul Getty Trust, (301) 395-0388; artsednet@getty.edu.

INDEX OF LISTS AT UCONN

A list of more than 100 Internet mailing lists of particular interest to those in higher education is being maintained by Stuart Brown, an assistant to the dean of students at the University of Connecticut. The lists are for student affairs professionals, faculty, registrars, information technology professionals, undergraduates, and others involved or interested in higher education. The information on each list includes the name of the listserv, a brief description of its objective, the subscription address, the number of subscribers attached to the listserv, and the average number of messages registered on a weekly basis.

The UConn list also provides information on how to subscribe to, and unsubscribe from, a mailing list. For more information, go to gopher.uconn.edu, then "Administrative Services," then "Student Affairs." From the Web, go to gopher://gopher.uconn.edu:70/00/admmenu/stuaff/stulist.wtby.

CAUSE'S INFORMATION RESOURCE LIBRARY

The CAUSE Information Resources Library is a repository for documents pertaining to the management of information resources in higher education, offering indexes and abstracts to help identify useful material from nearly 3,000 titles. With documents contributed by campuses and individuals, *CAUSE/EFFECT* magazine articles, conference papers and proceedings, white papers based on Gartner Group materials and reports, plus videos produced by member campuses and other sources, the library is a wealth of information for those in the field. Electronic access via the Internet allows on-line searches of the Library database and electronic ordering of documents via e-mail.

Most of the documents in the Library have not been formally published and thus are not easily found elsewhere. They include strategic plans, requests for proposals, system descriptions, policies and procedures, job descriptions, and many others. Anyone may order documents for a per-page charge which covers copying, shipping, and handling. CAUSE members receive all documents at a reduced member price. Contact CAUSE, 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; 303-939-0310; orders@CAUSE.colorado.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

You're Never Really Educated Without a SMILE ...

continued from page 1

student from thousands of students. For trying to implement these heretical thoughts, Chancellor Orenduff was shown the door.

James Gilbert, a professor at Maine said, "... we didn't want accreditation and we didn't accept the particular technology ...." Bill Scheurman at SUNY, commenting about distance learning said, "We'll support it if it provides quality education and doesn't put our positions in jeopardy." Of course Professor Gilbert didn't mention that it will be the faculty who decides what quality education is and what technology is right. And naturally, any thought of making faculty more productive, well, universities are not out to optimize faculty productivity as they might be if they were, heaven forbid, crass commercial establishments.

Galileo was chastised by the 17th century Aristotelian professors for his look into the heavens. Orenduff faced the same fate from late 20th century professors for his look into the future. The faculty at Maine won this test between the past and the future, and faculty members here and there will likely win a few more. But the outcome of the contest between traditional and distance learning will inevitably be a victory for radical change to the way education is delivered. Just as there was no stopping the Copernican theory (even if it lost a round or two to the church), distance learning and its brethren will become the norm in education, especially continuing education and what we now call undergraduate education. And that outcome, though it will challenge the very existence of universities, will be extraordinarily beneficial and will democratize education to a degree difficult to imagine today.

Howard Strauss is Manager of Advanced Applications at Princeton University.

From a distance

One reason we need distance learning is that the cost of a quality college education has become unaffordable and the situation seems destined to get worse. In its simplest incarnation, distance learning increases the productivity of faculty. Instead of one faculty member teaching a few hundred students per year (an optimistic estimate), many thousands of students can be reached. If a lecture is recorded, even more students can be reached. One problem with this simple model is obviously the lack of interactivity, but that is changing. To be viable, distance learning must improve the quality of education as well as improve the productivity of faculty. Students must learn more, learn faster, learn better, have more courses to choose from, and have more flexible schedules (e.g., the ability to take Econ 101 on alternate Sundays at 3:00 am).

However, while having some narcolepsy-inducing professor broadcast a lecture to millions of students might improve faculty productivity, it would not improve education. In the many years I've spent in school, I've found perhaps six professors that got me enthusiastic and excited about the material. In most other cases I managed to learn the material in spite of the professor's lack of ability to teach.

It is not surprising that few professors are good teachers. In most cases their careers are based on being good researchers, not on their pedagogical prowess. Selecting just the best professors to provide distance learning would be a start, but not enough. Even that step would alter the way many universities operate, by putting a premium on teaching ability. But professors simply don't take enough time or spend enough money to produce their lectures. Sure, they fuss a great deal about content, but few put enough time into presentation and pedagogy. Does a professor about to teach Econ 101 consider how different kinds of students learn? Does he or she consider the visual and graphical tools that would best convey the basic concepts of supply and demand? Does a professor make the best use of animation, sound, video clips, and the host of other tools that all of us take for granted on something as mundane as the evening TV news?

Of course not. It would take forever and would destroy any hope the professor had of getting any research done. Also, it would be prohibitively expensive and it would require skills that almost no professor has. If the best professors in the best universities can't do this, how is it that it is routinely done on the evening news?

Hollywood University

Because of the economies of scale, the evening news (and Hollywood and Madison Avenue) can afford to spend the money it takes to hire people with great information delivery skills (actors, actresses, newscasters, et al) and provide them with the support staff necessary to produce information that is compelling and entertaining—unlike most university lectures. This is not the fault of our faculty. If CNN were delivering the news to just three classes of twenty sophomores it would likely be done similarly to a typical college lecture. An expert on Bosnian studies would stand in front of a blackboard and spend an hour talking about the situation in central Europe.

continued on page 4

You're Never Really Educated Without a SMILE ...

continued from page 3

Distance learning can make education as compelling and entertaining as the best documentaries, the best movies, the best plays, and the best that our huge multimedia information and entertainment industry can offer. This can be done economically today while maintaining the serious content of college-level courses. But if universities can't afford to do this—or are unwilling to do this—who can? Sony can. AT&T can. MCI can. Disney can. Nintendo can. And so can every corporation that chooses to invest in delivery hardware and software. While keepers of the keys to higher learning may laugh scornfully at the idea of Sony or Nintendo conferring academic credit for a calculus course, they should reflect on the time when the churches, not the universities, were the center of learning. The focus of education could change again. If one can get a better education from Disney than from Euphoric State University, then many people will take their courses at Disney. Most employers will accept educational accomplishments, and not care whether a university or Universal Studios provided the instruction.

Universities have largely had the educational market to themselves. They have decided what to teach, how to teach it, and what to charge. They have decided what constitutes an education by spelling out the requirements for degrees and have decided who is admitted to try to get a degree, who of those admitted will actually get one, and who the next generation of academics will be who will perpetuate this grand scheme. Technology now makes it possible to offer alternatives to traditional ways of delivering education. The potential profit in competing in the education market makes it almost certain that there will be fierce competition. Of course universities can join this competitive fray, but they are badly structured to do so.

While faculty fear that distance learning will reduce the number of gainfully employed professors and increase the amount of time spent on teaching, there are really much more fundamental changes that distance learning will bring—if undergraduate education survives at universities at all. Among those changes are:

Faculty will rarely do any teaching. At very advanced levels, faculty will do research and will work with students as apprentices. This model is already seen in places such as the Institute for Advanced Study. At more basic levels, faculty will be content specialists who will work in teams to provide and validate the content of distributed courses. The people who deliver the material will be trained education broadcasters and actors. The broadcasters and content specialists will be backed by multimedia specialists, graphic artists, and the normal cast of characters that would produce a movie or TV special.

One-hour lectures by a single individual, now the norm for delivering education, will be replaced by a variety of educational delivery formats. Teams of people, documentaries on the subject, simulations, and other formats will be used. Some of these might last a few minutes, others a few hours. Since the material will be able to be replayed, long attention spans will not be required.

Although many students will involve themselves in intensive education immediately after leaving high school, many will do so for a year or two instead of four. The idea of getting all of your education by the time you are 22 is preposterous, yet that is what most people who do not get advanced degrees do today. Education companies will want people to view education as a lifetime commitment—as they should. Taking a course or just learning about something will be as routine as renting a video tape. In the future, your communications bill (it will replace your phone, cable, and on-line service bills) will likely include charges for phone calls, network shopping, movies, and sessions of a course you are taking.

With education transformed into a lifelong process, not a four-year process, and with education coming from many sources, the concept of a degree will have little meaning and people will increasingly not bother with them. Today, a university decides what one must do to get a degree. Tomorrow there will be no one to decide. Universities will not only lose their exclusive right to do undergraduate education (which will become lifetime education) they will also lose the power to decide what information constitutes an undergraduate education and how that information will be conveyed.

Courses will not be graded. Transcripts will include the material covered and copies of the work a student has done. Prospective employers (and maybe prospective mates) will, with a student's permission, be able to see what a student has really done and not have to rely on a single grade representing a professor's subjective judgement of hundreds of hours of work. There will be mentors' comments and comments by other people who have seen a student's work or who have been affected by it, but 4.0s and As will become as irrelevant as the hula hoop.

Bad Grades

Grades are one of the worst ideas

our current educational system imposes on students. This bad idea isn't the fault of the educational system. With the technologies and budgets that were available, grades were the best that could be done.

In a course, three variables that need to be managed are: the material, the time to complete the material, and the level of mastery of the material. We can constrain any two, but not all three. If we decide that ten facts are to be taught and the level of mastery is that all ten things are to be known perfectly then we can't also specify the time it will take to master those facts. Some people will learn the material very quickly, others will learn it very slowly.

In our current education system we have chosen to constrain the material and the time, and let the mastery vary, even though we must have known this was not the best choice. We measure the level of mastery by assigning grades. But we cannot let mastery of the material continue to be the thing that varies. If our purpose is education we must ensure that it actually takes place.

What needs to be done is to fix the material and the level of mastery, and let the time it takes to learn vary. The level of mastery will always be what we'd call an A+ today. The new educational scheme should be that a student will take a course that covers a fixed amount of material and will take as long as needed to master the material. If that happens in an hour then the student has completed the course. If after a long time, the student has still not mastered the material then the student can keep trying or give up on the material not learned. Since every course completed will show total mastery of the material, grades will be unnecessary. All grades in all courses completed will be A+. Unlike today, completing a course will mean that the material is well understood. And having mastered Econ 101, a student will be eminently qualified to take the next Econ course. What a prospective employer will want to know is not one's grades, but what courses were completed or what parts of what courses were completed.

When education required that there be scheduled, live interaction between a student and a professor then we could not afford to have every student take a different amount of time to complete a course. With distance learning and some readily feasible (but not yet available) software, however, we can now afford to do this. We can also get rid of the idea of a course as the smallest unit of learning.

SMILE: your own personal faculty

While we can't afford to have a professor with us all the time for all the subjects we are studying, we can have software that I call SMILE (Software Managed Instruction, Learning, and Education). SMILE would allow us to move through course material at our own pace. It would be backed by recorded, up-to-date, and sometimes live multimedia lectures and other educational material which SMILE would suggest we view at the appropriate time. SMILE would continually assess our mastery of material with quizzes and drills, and offer additional reading, viewing, and other reenforcement in areas in which SMILE determined we were weak. When SMILE couldn't handle a problem, we'd access the educational network and consult with peers or experts on the network.

SMILE modules would have to be customized for each course, but would use common objects (as in object-oriented programming) and algorithms to allow a student to move at his or her own pace. Students would either download SMILE modules from the network or run them directly on the network. SMILE modules would be aware of each other and aware of what the student had already done. Today, a student takes most of his or her courses from a single university; with SMILE and distance learning, a student would often take different courses from different places (e.g. IBM, Harvard, GE, Morgan Stanley, etc.). Of course these courses would last as long as it took for the student to master the material.

Back to the future

J. Michael Orenduff was forced to resign as chancellor of the University of Maine because he caught a glimpse of the future and tried to move in that direction. His vision of a virtual university was actually a very conservative evolutionary idea, but even that was more than the protectors of the status quo could handle. As it has always been, the future is more surprising than we can ever imagine and it tends to arrive before we are ready to give up the present. The way in which education is delivered is about to change quite radically. Maybe not exactly as described here, but enormous changes are on the way that will challenge traditional concepts of university education. Will universities emerge as a strong force in the future of education? Only if they adapt to the changes that are occurring and accept a leadership role in guiding and promoting those changes—something quite different than was done when history was made in Maine on page D24 of *The New York Times*. Or did you miss it? ■

The Need for Strategic Budgeting

by Charles R. Thomas, NCHEMS

In this time of rapid technological change, strategic planning can provide great opportunities in the use of information technology to support the mission and goals of colleges and universities. Strategic planning for information technology must, however, be conducted within the framework of the institutional planning process and must consider the institutional culture, history, and resources. It must also be accompanied by an equally important activity—strategic budgeting.

While many institutions engage in strategic planning activities at the campus level, few have extended those activities to the information technology units, and even fewer have linked them to budgeting and operations. An effective strategic planning and budgeting process ensures policy-level attention to the resources required to achieve strategic objectives.

Dimensions of strategic planning

The process described below is based in part on "Strategic Planning for Computing and Communications," a chapter by James Penrod and Thomas West in the EDUCOM book, *Organizing and Managing Information Resources on Campus*, and generally follows the model developed by Dr. Robert Shirley. The following important dimensions of planning for information technology are based on the list cited by Penrod and West.

Chuck Thomas is currently a senior consultant with NCHEMS, the National Center for Higher Education Management Systems. This article is based on a talk given at the 1993 CAUSE conference.

Information technology planning should be an ongoing exercise, regardless of the current technology in use at the institution. It should also be a formal process, have the support of senior administrators, use up-to-date planning methods, and result in documented output publicized to the institutional community. It should be both highly participative and institution-specific in its methods.

The process should involve the identification of potentially important technological developments and recognize when those developments make the transition from "state of the art" to "state of the market." It should be broad in scope but bounded by feasible solutions, both economically and technically. Perhaps most important, it should be driven by institutional problems and opportunities, not by technological developments.

The strategic planning process

An ongoing strategic planning process for information technology for the institution should include the following activities.

Establish the planning parameters. Determine who does what and how the planning process for information technology will relate to the institutional strategic planning process.

Assess the external and internal environments. Determine the level of effort appropriate for the institutional culture. Analyze the external environment to identify and assess major forces in the economic, social, technological, political and legal, demographic, and competitive areas that will present specific opportunities, threats, and constraints to the institution. Identify the strengths and weaknesses of the technology organization's human, physical, technological, and financial resources.

Determine institutional and constituency values. Solicit and document perceptions of and expectations for both academic and administrative computing. Conduct interviews with all of the major technology clients and document their opinions.

Identify areas for strategic decisions. Typical areas are: organizational mission, clientele, goals and outcomes, service mix, service areas, and comparative advantage.

Develop functional and operational strategies. Determine how each of the strategic information technology issues will be addressed, by whom, and through what processes. Discussion and suggestions for descriptions of the functional and operational strategies should be based on successful models from other institutions. Develop and document specific action plans for each of the major information technology organizational units.

Develop strategic objectives for the planning year. Come to agreement on a set of strategic objectives for the planning year, including development and/or acquisitions of new information technology products and services as well as maintenance and improvements for existing systems. Allow for iteration in the planning process, since many times other institutional units develop objectives that create information technology objectives unbeknownst to the information technology unit.

The strategic budgeting process

Executive and top-level policy com-

mittee involvement with the typical strategic planning process usually ends at the point of agreement upon objectives, leaving operational units to accomplish what they can within limited or reduced resources. A strategic budgeting process explicitly focuses executive attention on the activities and resources necessary to successfully meet the objectives. This is accomplished through a series of steps that relate resources required for operational activities to agreed-upon objectives. The process allows value judgments on resource allocation and trade-off decisions to be made at a strategic level before operational projects are undertaken, rather than being forced to make costly midstream adjustments when resources will not stretch to cover overly optimistic objectives, or when in process, operational failures occur.

An Objective-Activity Matrix approach works well. First, identify and briefly describe all of the agreed upon strategic objectives for the planning year. List these objectives across the top of a standard spreadsheet. Next, list all information technology activities required to achieve those objectives and all on-going activities down the left side of the spreadsheet. Then place a "1" in the spreadsheet cell under each objective supported by each activity, and total the spreadsheet vertically and horizontally.

If any objective column indicates no (zero) supporting activities, obviously that objective cannot be achieved, so it must either be eliminated or have supporting activities added to the list. If any activity row indicates no (zero) objectives supported, either there is an unlisted objective or there is some question why that activity exists.

Once all zero totals have been resolved, identify the resources (dollars and full-time-equivalent staff) required for each activity and estimate allocation percentages for activity resources for each objective supported.

Sum the resources vertically to arrive at the estimated costs for each objective. Value judgments can then be made as to the costs and benefits of each objective. If the estimated total cost shown in the Objective-Activity Matrix exceeds what is available, value judgments can also be made as to which objectives should be modified, postponed, or dropped. Several iterations may be required to reach agreement on a final matrix.

Conclusion

Recent developments in both hardware and software present dramatic opportunities for higher education, but planning and preparation are required to capitalize on them. The current emphases on campus-wide networking, client server computing, and the graphical user interface require major changes in traditional institutional computing and communications environments, but these changes will not happen without executive involvement and leadership. The processes of strategic planning and budgeting can focus institutional attention on the appropriate institutional issues, and with institution-wide involvement, foster a common vision for information technology. ■

"The distance learning environment has changed dramatically. Educators increasingly seek new solutions to a myriad of challenges including rising costs, reduced operating budgets, over-utilized resources (from faculty to the physical plant), and growing competition for a declining student pool.... Distance learning has become a core educational strategy in the 1990s, with a reach that extends to a broad cross-section of institutions and curriculum providers around the world."

John Walsh and Bob Reese
"Distance Learning's Growing Reach"
T.H.E. Journal
June 1995

In Future Issues

- *Is multimedia fulfilling its educational promise yet?*
- *Making smart technology investments*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. Our institution is spending way too much on technology, and we are dealing with an increasingly out-of-control situation. As a senior administrator, one of the things that really bothers me is that outside of the information technology unit, no one knows enough about technology to challenge the resource requests put before us. Could we accomplish Project X with fewer resources? We usually can't answer that question. How do we deal with this?

A. *Assuming you have some level of trust in your IT people, we would like to suggest that this is not the right question to ask. It sounds more as if you are dealing with priority issues, and better questions are, for instance, "Should we be doing Project X at all? Of what benefit is it to the institution? Is it in line with our identity and strategy?" These are not technology questions, nor are they asked of the technology people; these are business questions that every senior person at your school should be as comfortable dealing with as they are in any other area of the institution.*

Q. You have in the past recommended a three-pronged committee structure for information technology made up of a high-level policy committee and two department-level advisory committees, one for administrative and one for academic. That sounds fine as far as it goes, but what happens to networking and other institution-wide infrastructure issues in this model?

A. *Certainly broad resource allocation issues and discussion of major initiatives for infrastructure areas, including networking, the data center, and so on, should be dealt with at the policy-committee level. Since basic networking strategies are already in place at most institutions by now, as is the basic operation of the data center, it would not seem as if these areas would require the same kind of substantive discussion and involvement at the advisory committee level that administrative and academic computing issues require. If that's not the case, either a third advisory committee, parallel to the academic and administrative committees (with the chair similarly on the policy committee to provide that linkage), or a task force made up of some members of both advisory committees could be formed to deal with specific issues and concerns as they arise.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse NY 13210

printed on recycled paper

THE EDUTECH REPORT

August 1995

Volume 11
Number 5

The Education Technology Newsletter for Faculty and Administrators

Counter-Implementation Strategies

by Steven Gilbert, AAHE

In the early 1980s, Peter Keen of the Sloan School of Management at MIT was invited to give a guest lecture to the Wharton Executive MBA program. He chose "Counter-Implementation Strategies" as his topic, and offered several examples in a memorable, witty, and valuable presentation. The one I remember best was "Let's get it just right the first time."

The strategy goes like this: If someone offers an idea for your institution that you want never to be implemented, you should jump in immediately. Praise the idea highly and give several additional reasons why it is so important for your institution. Explain how this idea can make a significant contribution, so significant that we shouldn't risk getting anything less than the full benefit from it. Say things like, "In fact, this idea has such enormous potential that we must not leap in with an incomplete version and miss something valuable. Let's make sure we take every step necessary to get everything we can. Let's not begin until we have everything prepared perfectly...." You are now prepared for permanent delay. Each time someone is ready to actually implement the idea, just point out one more bit of preparation that should be done.

In the spirit of Keen's presentation, I would like to offer my list of counter-implementation strategies—strategies for avoiding improving teaching and learning through more effective and widespread use of information technology and information resources.

Strategy 1: "Let's get it right the first time." Just as Keen suggests, this is extremely effective. Convince the president and board that we'll

continued on page 3

"The workforce is demanding and receiving a say in how their organizations are run. Acceding to this is not altruism on the part of management, but rather a recognition that there is a better way of doing business. By giving up control of individuals, managers gain better control of the organization.... Those managers who are control-oriented may not survive the transition—but their days were already numbered. Teams will only hasten the process, as we transform our organizations into more enlightened institutions that treat people as adults who have productive and innovative contributions to make."

Larry Conrad and Sheila Murphy
"The Manager's Changing Role in a Teams Environment"
CAUSE/EFFECT
Summer 1995

NEWSBRIEFS

GUIDELINES FOR EVALUATING CAMPUS IT RESOURCES

The Higher Education Information Resources Alliance (HEIRAlliance) has developed a new set of guidelines for evaluating information resources that colleges and universities can use when doing institutional self-studies, and that regional accrediting associations can consider as part of the accreditation process. The HEIRAlliance is a cooperative project of the Association of Research Libraries (ARL), Educom, and CAUSE, the association for managers of information resources in higher education. In late July, the guidelines were sent to presidents and chancellors of all U.S. colleges and universities, with a letter from James Applebee, president of the American Association of State Colleges and Universities.

Copies of the guidelines are available electronically by sending e-mail to heira@cause.colorado.edu containing the message **GET HEIRA.GUIDE**. Print copies are also available from CAUSE for $5 each; call (303) 939-0310 in Boulder, Colorado.

NEW EDUCATIONAL FAIR USE GUIDELINES

New guidelines that clarify educational "fair use" rules for today's multimedia environment will be unveiled in a live satellite broadcast from the PBS Adult Learning Service on September 21, 1995. Designed especially for educators, trainers, instructional technology specialists, and library staff, the program can be downlinked anywhere in the country. In the face of the need to clarify the law in a rapidly changing environment, the Consortium of College and University Media Centers (CCUMC) initiated discussions with proprietary groups, educational associations, and the U.S. Copyright Office. The resulting committee spent the last several months hammering out the guidelines that will be released to the public during the September telecast.

The event will run from 1:00 p.m. to 3:00 p.m. Eastern Time and will be transmitted on both Ku-band and C-band. Organizations that wish to obtain pricing information for downlink licenses, including multiple site discount options, or that need other information, should contact the PBS Adult Learning Service at (800) 257-2578.

NEW ON-LINE ACCESS FOR CHRONICLE SUBSCRIBERS

"Academe Today" is a new on-line information service from the *Chronicle of Higher Education* for its subscribers. The new service, accessed through a special log-in and password, provides a daily summary of higher-education-related news, as well as government reports, statements from professional societies, job postings, information about upcoming meetings, discussions of scholarly books, and five years of article archives. There is no charge for current Chronicle subscribers.

For more information, contact the Chronicle at 1255 Twenty-Third Street, N.W., Washington, DC 20037; today@chronicle.com.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Counter-Implementation Strategies ...

continued from page 1

get a much better return on our investment in information technology if we just wait six months for the new _____. (Fill in the blank with new technology of choice).

Strategy 2: Do not collect anything in one place for easy access. Don't collect the most relevant information about what kinds of support services (computing, library, faculty development, A-V) are available under which conditions for faculty and students. Don't collect information about who to contact for such support services. Don't include such information in student or faculty orientation materials, departmental offices, faculty manuals, or student handbooks.

Strategy 3: Retain traditional reward structures. Don't mention faculty use of information technology for instruction in promotion and tenure policies.

Strategy 4: Promise too much. Each spring, make unfulfillable promises about the capabilities and availability of technology for the faculty and students next fall.

Strategy 5: "We decided that you need to..." Schedule a meeting of your own section (office, department, etc.) of the college or university. Discuss ways in which technology can be used to improve teaching and learning. Develop some plans that depend on some of the services or resources from another group on campus—a group you didn't invite to the meeting. The next day, drop in on the leader of that other group. Casually mention the meeting you've just held, your new plans, and the expected role of his/her group. Begin sentences with "We decided that you need to...."

Strategy 6: Maintain your vision of your institution, no matter what. Ignore data about the changing composition of your student body and faculty—especially about the proportion of part-timers in both groups.

Strategy 7: Talk publicly and frequently about how "distance education" is going to increase "faculty productivity." Don't answer questions about the impact on the number of faculty jobs. Don't explain what you mean by "distance education."

Strategy 8: Concentrate on technology products. Get your institution to commit to new high band-width wiring for every dorm room and office, and for all the hardware and software needed. Don't budget any funds for training or maintenance. Eliminate at least one technical support position.

Strategy 9: Target junior faculty and put them at odds with their senior colleagues. Find a couple of young, untenured faculty members eager to use interactive multimedia. Provide some funding, training, support services, and a very small amount of release time for their work on developing multimedia for use in their own teaching. Send a memo to their department chairs praising their initiative and dedication to teaching and to new technology—in contrast to the rest of the Luddites in the department. End with: "In the long run, I'm sure these two exemplary faculty members will get back to their research, but I imagine it will seem rather dull and pointless after this year's experience with instructional technology." [This one is especially good for research universities.]

Strategy 10: Act hastily to adopt new products. As a faculty member, require all your students to use a new CD-ROM you like—based on the 30 minutes you had to examine the review copy. Don't ask your students about the kinds and capabilities of the computers they own. Don't tell them how to obtain the software. Don't reserve space in public computer labs. Don't check the capability or the capacity of the campus computer lab.

Strategy 11: Replace teaching with technology. Assume all of your students are eager to use computers as the primary means for all their learning. Assume they are each highly self-disciplined and self-motivated. Replace all live presentations with pre-recorded videos that students can view repeatedly whenever they want. Discontinue those expensive small discussion opportunities. Replace all science labs with computer simulations. Let them all use e-mail!

Strategy 12: Don't accommodate any hesitation. Whenever anyone questions greater instructional use of information technology, laugh out loud at their naivete and read this quote to them: "...if the growth of productivity in education had matched the growth of productivity in the computer industry, we would now be able to consolidate twelve years of public education into ten minutes, costing five cents per student. How much longer can higher education afford to offer inefficient instructional programs that do not meet the demand of the marketplace for graduates?" [Melnick, "Education, Media, and the Future," a paper presented at Managing Media for Change Institute, San Francisco, May, 1990.] That should show 'em. ■

Steven Gilbert is the director of technology projects at the American Association for Higher Education. This article is based on a recent posting to his listserv, AAHESGIT.

The Key to Wise Inve

by Robert Hahn a

Once college presidents have solved the problem of the day, managed the crisis of the week, and tended to the latest lawsuits, they turn their attention to how their institutions can be strengthened for the future. Near the top of most presidents' lists of critical issues is educational technology.

For all institutions, some type of investment in educational technology is essential, and virtually all of them have made some purchases already. But in deciding what types of investments to make for the future, presidents face a complex set of problems. They must decide what portion of their shrinking budgets should be allocated to this expanding domain. They must determine, from the array of technological choices, which options are appropriate for their campuses, distinguishing between the imperative and the luxurious, the essential and the grandiose. What do campuses need to invest in now, to keep them from falling behind in a few years? What sorts of technology will benefit students the most?

Consider this scenario: The director of academic computing presents his college's president with a plan to upgrade the computers provided for instruction and to link them into a network to which all students and faculty members have access. The proposal has a price tag of about $1-million for hardware and networking costs, which breaks down to an average of $479 per student. That's a bargain and a wise investment, claims the director of computing. He then presents some more specific arguments:

"Our enrollment has been growing, but our budgets—especially our salary budget—have not. An investment in educational technology will help us handle increased enrollment without hiring more faculty members.

"Investments in technology bring quick results. We can be providing the benefits of state-of-the-art instructional technology to students within the year.

> *Near the top of most presidents' lists of critical issues is educational technology.*

"Our competitors are investing heavily in educational technology. If we fail to keep pace, students will choose other institutions, and we will be playing catch-up.

"As students gain access to the global Internet, their sources of academic information will broaden, lessening the pressure on our library.

"The total cost of gaining all these benefits is very modest. If we deploy one public computer for every 10 students, a typical ratio, we will need to buy 200 computers to serve our 2,000 students. A mid-range Power Mac, well equipped for our needs, will cost us about $3,500 at educational prices, or about $700,000 in all. Setting up a deluxe network connecting these computers to students' rooms will cost another $24,000.

"This can be our entry ramp to the information highway. If we are not part of the action, we may become an academic ghost town. We need to decide soon, while supplies are available or before prices change."

Anyone hearing such a presentation should be uneasy. Flying high in this proposal are several major red flags:

The director makes sweeping, nonsensical financial comparisons and claims. These include unsubstantiated, debatable claims concerning possible reductions in what will have to be spent for faculty salaries, libraries, and other traditional budget items.

The proposal concentrates entirely on hardware, with insufficient attention given to software, training, and personnel support. The error is compounded by the exclusive focus on a particular brand, neglecting alternative vendors and options. No mention is made of other costs involved in educational technology, including training users and assisting them as problems and questions arise. The costs of maintenance, depreciation, and periodic replacement of equipment also have been ignored.

Key elements of institutional life are underplayed or forgotten. Indeed, it is unclear from the proposal in what ways one can expect teaching to be improved or learning enhanced. It also does not take adequate account of issues of institutional and personal resistance to change. What resistance will this

---

Robert Hahn is president of Johnson State College. Gregory Jackson is director of academic computing at MIT. *This article appeared originally in the May 26, 1995 issue of The Chronicle of Higher Education and is reprinted with permission.*

tments in Technology

Gregory Jackson

plan encounter from departments using other equipment or from faculty members or administrators who think this is an unwise use of scarce dollars?

The proposal stresses the need for a rapid decision. Beware of claims (supplies are limited, prices may go up!) designed to make decision makers feel guilty and act without careful study.

Recognizing such warning signs and fallacious arguments will help presidents and other administrators make better decisions, but that is only half the battle. Presidents and other top decision makers may bring their own myopia, misinformation, and bias to discussions and decisions about educational technology. For example, they may see educational technology as a one-time investment or believe that their institution's continuing need for such technology can be filled through grants from private donors or government agencies or by gifts from vendors, instead of realizing that they must devote a portion of each annual budget to such expenses.

They also may expect that investments in educational technology will automatically save them money in the long run. Along with this expectation, they may believe that educational technology will somehow produce quicker, better, more-assured results than higher education can normally promise. Such unrealistic expectations can lead, in turn, to setting unattainable benchmarks for the success of an investment in technology. Administrators also may buy educational technology without thinking about how to encourage faculty members to adapt their teaching to incorporate it.

Many of the stumbling blocks to wise planning and investing can be avoided if presidents and other administrators, including directors of computing, follow some important guidelines:

Be clear about the purposes to be served by the technology under consideration. State the expected benefits in the clearest possible terms—and in plain English. Once the new hardware and software are in place, *who* will be able to do *what*, and *how* will they do it?

> ***State the expected benefits in the clearest possible terms—and in plain English.***

Be realistic about the outcome. This requires recognizing that information technology does not necessarily save time or money. It may enable us to do some things that we cannot do now, such as provide students with feedback on their work via electronic mail, or to do some things better and more easily than is now possible, such as attain access to library collections and conduct research. But such benefits should not be confused with economies. Furthermore, we may be tempted to believe that because technology is involved, the benefits are easily measurable. But, in fact, technology provides just another means of teaching and learning, and its effects are no more certain or easily assessed than those of a reading or writing assignment, a laboratory demonstration, or a lecture.

Build the full costs into your budgets. They include the costs of installation, training, and support services when new systems are purchased, as well as those of maintaining and replacing equipment and of training new students and employees.

Design a program to encourage faculty and staff members to make full use of the technology in their daily activities. Assign responsibility for insuring that it is carried out.

Take all the time you need. Not to be confused with delay, evasion, or obfuscation, this time should be used to investigate the available options among vendors, brands, and systems. And allow for a full review of the proposed purchases and operating plan by a representative group of users, including faculty and staff members at all levels.

If presidents and directors of computing, as well as other administrators and faculty members, all agree to follow these guidelines, they should be able jointly to reach wise decisions about investing in educational technology. They can avoid getting stuck with systems and equipment that fail to meet the needs of many users or that become obsolete too quickly. They can make decisions about technology with the same foresight they use in hiring a faculty member or planning an academic program. After all, such decisions require not only technological literacy but also the sound judgement, the probity, and the sense of purpose that, ideally, we bring to all of our decision making. ■

BEST COPY AVAILABLE

Two Separate Worlds—And They Should Be

Many colleges and universities these days are looking for ways to reduce IT spending. At the same time, many are also looking to gain synergistic relationships where they did not exist before, and even to provide enhanced IT services (both in quantity and quality) to the user community. One of the most popular ways to do this is to combine administrative and academic computing service units into a single unit, providing a generic set of services based on function, rather than on user identity.

On the surface, this has many advantages. Certainly, both sets of technical people have much to learn from each other, and blending them together, especially if they can share physical space, can produce a good amount of cross-fertilization. In addition, if there was any duplication of services before (often seen in the area of microcomputer support or networking), this restructuring offers the opportunity to downsize by eliminating the duplication, or even better, to redeploy scarce technical talent to cover more service areas.

But there are some serious downsides to this as well. One of the most insidious of them is that combining the service needs for academic and administrative users often ignores what those needs really are. Of course it's true that there are many generic needs and non-specific uses for IT, such as the provision of a robust telecommunications network. However, if one takes a close look at what is most needed—and most valued—by each set of users, one will find that many of the services are quite different. What makes the situation particularly difficult is that users will get their service needs filled one way or another, even if it is not by the IT department. And, in fact, what we see happening more and more in institutions that have combined their departments is the addition of user department staff to provide the IT services formerly provided by either the academic or administrative computer services group.

The point is that IT service departments that define themselves as "utilities," that is, responsible for providing a generic, non-specialized set of services to all users (network support, microcomputer troubleshooting, basic training, etc.) may be very efficient in terms of the expenditure of the IT department's resources. But looked at more broadly, it often ends up costing *the institution as a whole* more to provide IT services, because the users, in their quest for effective, rather than efficient, services, find ways to get what they need, such as through hiring their own technical staff members. What users really need from the IT department is for it to look and act not like a utility company, but like a travel agency. Utility companies don't care who their customers are; travel agencies care very much, and go to great lengths to classify their customers according to the customers' needs and desires.

If one takes a close look at what is most needed—and most valued—by each set of users, one will find that many of the services are quite different.

Are academic and administrative users different in their needs and desires? You bet they are. In fact, they are every bit as different from each other as business travelers and leisure travelers are. Yes, one can take on the characteristics of the other under certain circumstances from time to time. But for the most part, their approaches, their attitudes, their perspectives, their tolerance levels, and their willingness to pay for certain services they value, are entirely different. And when they don't get what they think they need, whether that's an upgrade to a seat in the first class section of the plane or a quick desktop screen display of today's tally of incoming freshman deposits, they go elsewhere.

Fortunately, many consolidated IT departments still have separate groups responsible for academic (usually classroom support) and administrative computing (usually applications programming). In fact, some consolidated departments really don't look very different than they did before they combined, except that together, they report to a single person lower in the administrative structure than they did separately. Whereas once administrative computing might have reported to the financial vice president and academic computing might have reported to the provost, now they both might report to an associate vice president or an executive director. So what appears to be consolidated on the surface is actually, in effect, as separate as before, very likely responding to the forces that are keeping them (rightfully) separate.

What is far more problematic is the truly consolidated department, the

one that has rewritten job descriptions, done away with previous sets of responsibilities, and eliminated all distinctions among the service providers. The IT staff in these departments are often called "information specialists" or "technology assistants" or some such. Ready to leap to the aid of any user, convinced by their managers that it doesn't matter whether the network problem they are trained to handle technically is in the Registrar's Office or the chemistry department, they are leaving users feeling more and more abandoned. What an IT staff member in this position does not necessarily appreciate—only because they're told that it doesn't matter—is that if a person in the Registrar's Office can tell someone in the computer center that her LAN is down right now and that she has a line of students in front of her window waiting to register, and if that someone really understands what that means and responds accordingly, then she is a happier customer. If, on the other hand, the response is one of a lack of understanding of the urgency of the situation, or is insensitive to the circumstances in any way, and if enough of these incidents occur, eventually the Registrar's Office is going to get its own network support person. And this is exactly what we see happening in institution after institution.

The most successful service organizations, IT or otherwise, are the ones that know their customers best. One of the hottest areas for the future development of commercial services is coming out of the increasing ability to be able to differentiate existing customers based on information kept in the corporate database. A recent article in the *Wall Street Journal* discussed whether American Express is likely to survive the rapidly increasing competition in credit cards. Most analysts agree that its best shot at survival is using the very rich data it has in its databases about its current credit card customers and striking deals with various retailers to offer each customer a series of specialized promotions when the customer receives his or her bill each month. While this may represent specialization taken to its extreme, it is nevertheless a good role model in terms of customer attention and treatment. Clothing stores distinguish between suburban matrons and urban teenagers. Banks distinguish between business depositors and Christmas Club users. And the IT department should distinguish between academic and administrative users.

Yes, we have to keep in mind that there are some services that span both sets of users, just as with airlines, everyone wants to fly safely and on time. However, even in these cases, providing a front-end service person that is specialized to the user, rather than to the function, is more effective. We need to get rid of "the" single Help Desk for everyone, we need to rename the "information specialists," and we need stop acting as if a microcomputer is a microcomputer is a microcomputer, regardless of whom it serves. ■

"There is no mediated program that cannot be mediated by an alternative medium. Unfortunately, the battle between fashion and efficacy seems to have been won by fashion. Today it is fashionable to 'do a CD-ROM' with little regard for other less expensive methods of delivery (such as print). What is puzzling is that the question, 'Can it be done cheaper using other forms of mediation?' seems to be routinely overlooked by developers. Fashion seems to have won out even over economics."

Richard P. Lookatch
"The Strange but True Story of Multimedia and the Type I Error"
Technos
Summer 1995

In Future Issues

- *Hot Issues: 1995-96 - our annual survey*
- *Is multimedia fulfilling its educational promise yet?*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. So here we are, our new administrative system has been in for a couple of years, most of our users are trained, fairly happy, and seemingly productive. Why, then, as we look around the institution, do we see not only no new economies as a result of the system, but even some real "diseconomies"? That is, the new system seems to have introduced the need for new (additional) staff in each department who actually understand the new system, can get reports out of it, can train their department colleagues, and so on. We were expecting to end up with fewer, not more, people when we were all done. Did we do this backwards, or what?

A. *Probably not. But your concern is understandable. It is also not unique to your institution. The current generation of information systems is characterized by tremendous power and functionality, but also by great complexity. Many institutions are at the stage of dealing with the complexity either by adding staff or by severely underutilizing the system. The real answer to the economic question seems to lie in what many are calling "reengineering." That is, rather than just employing the system to automate existing tasks and procedures ("paving the cow paths"), using the power of the new system to rearrange, restructure, and even redefine areas such as student services, institutional outreach, information access, and so on, is likely to be where the real payoff for all the time, effort, and financial investment is. Even with reengineering, however, you may not see the economies you have been expecting, due largely to the fact that when the same number of staff are no longer needed in certain areas (such as clerical support), the culture of higher education has resisted their outright termination, preferring instead to have the staff do other things—thereby increasing services rather than decreasing costs.*

Q. I'm new to this business, so perhaps you can clear something up for me. Is it a requirement in colleges and universities for the computer science faculty and the computer services department to not get along with each other?

A. *Yes, absolutely. In fact, if you find an institution where this is not the case, you should report them immediately to their regional accrediting agency.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse NY 13210

41

printed on recycled paper

THE EDUTECH REPORT

September 1995

Volume 11
Number 6

The Education Technology Newsletter for Faculty and Administrators

Hot Issues 1995-96

by Thomas Warger

As our readers know, each year we do a telephone survey of information technology managers throughout higher education to gain insight into what's on their minds for the coming academic year. This year's survey yielded a great deal of thinking around a wide range of IT issues, from reengineering to funding to rapidly rising expectations.

Re-thinking. This is larger and stronger than just "reengineering" administrative processes, although that is the most widespread instance cited. In the widest-ranging sense, it is a matter of stepping back and trying to take stock of the impact of IT on campus activities. For administrative work, it involves, as one respondent put it, "the re-definition of what work is..., what it means to come to work." The new patterns of shared information lead to re-assessment of how services and offices are organized: we need to be more fluid and less hierarchical. What has been learned about workgroups is worth investigating for what it might tell us about how to organize and equip workers in light of IT. The inter-relatedness of workers needs to be understood and turned into effective peer support. Having done much to transform the workplace, we now must understand it in its new configuration so as to be able to support those who work in it.

In instruction, classroom and teaching methods are being re-thought. Distance learning is starting to provoke serious thought about who will be the students and how they will be reached. The Web and the Internet generally are sparking a new round of enthusiasm among faculty to look for ways to use these resources in their classrooms and to supplement their courses outside class sessions.

continued on page 3

"Liberal education is incomplete if it does not prepare educated people to address the presence of technology—and more importantly, the presence of the information products of technology in the modern world—in an informed and critical way.... The dismissal of computers as mere machines by liberal education distracts attention from the fact that the information products of technology define modernity: mass communications mediate most of the information in our culture, and digital technology produces the images and information which saturate everyday life."

Peter Lyman
UC Berkeley
"What is Computer Literacy?"
Liberal Education
Summer 1995

NEWSBRIEFS

ACM/SIGUCCS 1995 USER SERVICES CONFERENCE

"Winning the Networking Game" is the theme of this fall's ACM SIGUCCS conference, to be held October 15–18 at the St. Louis, Missouri Marriott Pavilion Downtown. The fall conference features sessions relating to end-user support on university and college campuses. Specific focus includes: the Web, documentation, networking issues, training, student consultants, managing computer labs, and much more. An excellent selection of pre-conference tutorials are also available on Sunday, October 15. The opening speaker is Vinton Cerf, President of the Internet Society. Cerf is generally credited with setting off higher education on this networking frenzy with his work on writing the TCP/IP protocols in the 1970s under a DARPA grant while at Stanford University.

For more information, contact Linda J. Hutchison, SIGUCCS '95 Program Chair, Iowa State University Computation Center, 291 Durham, Ames, Iowa 50011; 515-294-1578; linda@iastate.edu. The SIGUCCS '95 homepage is on the Web at http://siguccs.iastate.edu:8001/.

SURVEY FINDS BARRIERS TO IMPLEMENTATION OF CAMPUS TECHNOLOGY

On the Brink, a recent report from the American Association of State Colleges and Universities (AASCU) on the use and management of information technology in higher education, found that while many state colleges and universities have IT plans and increasingly use technology for teaching and learning, most are experiencing barriers to meeting their IT goals, including financial constraints and competing academic priorities. Other findings in the report concern computing entrance requirements, computer literacy goals for graduation, the use of e-mail, and distance learning.

Copies of *On the Brink*, a report on the survey results, and a directory of technology examples on AASCU campuses are available for $10 (members) and $15 (non-members) by sending a check to AASCU Publications, One Dupont Circle, Suite 700, Washington, DC 20036.

EDUCOM '95: LEADING THE WAY

The futures of higher education and of technology are closely intertwined. But how can educators and institutions of higher learning best harness the information revolution? How should the vast sea of on-line information be managed, and what ethical issues does it raise? And what effect will the convergence of learning, communications, and information technology have on tomorrow's scholarship? These are some of the central issues facing educators, administrators, policy-makers, and other participants in the EDUCOM '95 conference, hosted by Reed College, to be held at the Oregon Convention Center in Portland, October 31–November 3.

For more information on the conference, contact Lynn Zempel, (202) 835-7475; zempel@educom.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Hot Issues 1995-96 ...

continued from page 1

For IT support services, re-thinking means being more thoughtful and assertive about managing change. It means "turning people's attention to what is possible with what we have, and away from worrying about what we don't have yet," as one IT manager put it. But it also means being realistic about what to promise or to lead people to expect, to be more attentive to what users really need and want (as opposed to what the support services people think those customers need), and to decentralize those services—on the model of the technology itself—to be closer to the customer, and more responsive to needs.

Re-thinking also means getting back to basics in education. What is it that IT can and should be accomplishing? There is much that is appealing in currently hot technology, but are we ensuring that education is driving our interest in the technology, and not the other way around? Does learning need to be re-invented in light of IT's empowerment of those who use it and perhaps do not work in the old patterns and by the old rules? If people work in teams, does our approach to IT training and support follow that model? We should be ready to move beyond teaching how to use a software package, and instead teach how to use information in better ways.

Partnerships with industry, too, are in need of re-thinking. Companies developing new products should think in terms of working with consortia—rather than selected, individual institutions—to be better attuned to whole markets of potential customers. Colleges and universities can listen better to what employers say they need in their graduates and also include local businesses in their instruction on current technology. When curricular development does not keep up with advances in technology, students and their eventual employers are short-changed. One respondent put it this way: "Some of the ways we do things on campus have to change; we have to be more responsive to the customer."

Funding. While no one claims to be amply funded, this issue now appears to be quite variable in its expression. Comments ranged from "We are broke, broke, broke" and "How do we convince [top management] to spend what is needed?" to "saying that we feel we need to do this is no longer such a hard sell." Virtually everyone in campus governance acknowledges the core importance of IT; many report they are now coordinating IT planning with general, strategic planning on their campuses.

Some are becoming concerned that the overall trends in the cost of education and the ability and/or willingness to pay are very discouraging and pose serious problems for all aspects of higher education.

One person commented that it is ironic that we have such limited financial resources in IT just at the time when unprecedented numbers of people are interested in its benefits. Those feeling the most severe funding pressures still find it a challenge to equip all faculty and staff and to fund a reasonable replacement cycle for that equipment. Keeping computer labs current, protecting and extending the life of network bandwidth, and coping with the soaring demand for modem access to campus networks and the Internet rank as leading sources of cost pressure.

It seems clear that the sources of funding will need to change. Chargeback for modem access is being considered, even where institutions have no history of charging end users for IT. Partnerships with industry may need to become part of the means by which we fund replacements. Without much doubt, funds will need to be re-directed from other areas of campus budgets and sources not yet tapped or even identified.

One respondent noted, however, that as non-IT senior administrators become more experienced in dealing with IT issues they "are beginning to see the interrelated nature of their needs." If there is a silver lining in the clouds of gloom over constrained financial resources, this might be it.

Internet applications. Virtually everyone commented on the enthusiasm they are seeing for the Internet. Interest spans faculty, students, staff, and senior administrators. The true value of the Web and Internet for higher education is not yet settled (as one person said, "the depth is not there yet"), but most feel the potential is strong, and the demand is nearly overwhelming.

Campus network infrastructure risks being overwhelmed, however. The cost in staff support resources is worrisome, because the sheer numbers of people eager to set up their own home pages or to explore potential new instructional applications is so large.

Those campuses that have not yet established a full-fledged Web site

continued on page 6

Thomas Warger is the former director of computer services at Bryn Mawr College and is about to become the assistant coordinator for information technology for the Five Colleges, Inc. in Amherst, Massachusetts.

Seven (7) Types

by Joh

There are seven (7) types of redundancy, each of which is found frequently in organizations of all kinds, and especially in higher education. Some types of redundancy are relatively benign; some less so.

Type One:
Defensive Redundancy

The purpose of defensive redundancy is to give auditors and such people a security blanket. For example, your auditors will ask you whether your institution's database is backed up. Do not give the auditors a flip answer, because auditors are not flip people (except, according to reliable rumor, when 9 p.m. rolls around and they are still awake). You may think your information is backed up, but the auditors don't really want to know if the information is backed up; they want to know if it is backed up in an underground vault in eastern Nevada. Welcome this line of thinking! Never argue with an auditor, never resist an auditor, and never, ever laugh at an auditor. Tell your auditors that you are extremely pleased with their recommendation and that you will immediately ask your superiors to budget 30 million dollars to construct a redundant data center built underground in—where was that? —eastern Nevada.

Type Two:
Rhetorical Redundancy

The purpose of rhetorical redundancy is to give assistance to administrators who wish to re-consolidate power. The classic example is provided by the teaching of statistics in a college or university. It is highly likely that your own institution originally placed the responsibility for teaching statistics with the Mathematics folks, but that over the years various other faculties—City Planning, Agriculture, Industrial Engineering, Political Science, and so forth—decided that their best and brightest majors were being systematically and slowly disemboweled by the Math department. These other departments therefore came to the conclusion that all mathematicians

> *The auditors don't want to know if the information is backed up; they want to know if it is backed up in an underground vault in eastern Nevada.*

(or, in statistical jargon, 100% of all mathematicians) are crazed madwomen. Of course, I use the technical term "madwomen" inclusively, to cover deranged mathematical persons of both sexes. So what did those other faculties typically do about this (possibly unfair) perception of the insane cruelty of the Math department? Quite understandably, they created "Statistics for City Planners," "Statistics for Agricultural Economy," "Statistics for Industrial Engineering," "Statistics for Political Scientists," etc. Obviously, what that maneuver created was not a pretty picture. You can see the problem immediately: the word "statistics" appeared four times in that single unfinished sentence! Whoa! Whoa! Redundancy alert! Redundancy alert! Beep the Provost! Beep the Provost! Now, all (or at least many) provosts can count to four, and know as well as you and I (or even better than you and I, for they are provosts, and we are not) that if you have four statistics courses you have at least three statistics courses that are shockingly redundant. In fact, it doesn't even take a provost to be shocked; any senior administrator who can count as high as four (and there are dozens of them throughout this great nation) will deplore this sad state of affairs—even if the madwomen in Math don't themselves happen to care one way or the other, and in fact don't give a damn about anything but fractals (if they even care about fractals, which is unlikely, because why should anyone care about fractals, for crying out loud —do you?). Well, a problem identified is a problem solved!—and the bastard Statistics courses (which, ironically, is also what the students call them) are then done away with. And so now a new generation of spoiled, ignorant, ungrateful students will soon find out what Real Life is all about, when they are made to take the Math department's diabolical "Statistics Of Your Worst Conceivable Nightmare" course.

Type Three:
Turf Redundancy

Turf redundancy has this in common with rhetorical redundancy: it's entirely a matter of opinion. Entirely. According to one opinion (mine, for example), we are all redundant, each and every one of us. God simply did not need this completely ridiculous number of specimens of all races, colors, creeds, and athletic shoes to decide whether His so-called "human

John Gehl is editor and publisher of Educom Review and co-author of Edupage.

# of Redundancy

Gehl

being experiment" was a success. It was obviously not a success, and the experimental design was (forgive me, O Lord, but You really need to try to be honest here for a second) megalomanic "Big Science" overkill. Surely one human subject was enough to test Your inane hypothesis—or maybe two or three or four human subjects. But clearly by the time young Cain came along and he and his brother started screaming at each other and started hitting each other, for God's sake, at that point You as Principal Investigator should have declared Your grand experiment a total screw-up—destined to bring forth nothing but television and skateboarding. At least, that is certainly my own humble opinion, though others are free to have entirely different opinions. For instance, others may perhaps feel that some individuals (e.g., they themselves) are necessary and nonredundant whereas other people (e.g., you the reader) should hit the road. Well, unfortunately, that rather hostile attitude suggests the existence of a problem resolvable only with attack weapons. For if two people are really doing exactly the same thing, there is no logical reason to call one of them redundant rather than the other. Do you see what I'm saying? And since you are the one who's been identified as redundant, surely you understand that! Hey, where are they taking you? Will you be coming back, do you think?

Type Four:
Parkinsonian Redundancy ____
I have named Type Four redundancy in honor of my hero, the great C. Northcote Parkinson (who discovered Parkinson's Law, which states that work will expand to fill the time allotted for it). Parkinsonian redundancy is quite different from turf redundancy. Whereas with turf redundancy two or more individuals are fighting to do the same job, with Parkinson redundancy there is no real job to be done, and so it is impossible to declare any particular worker redundant, because no one is doing real work. They are doing "make work." They are creating confusion and blowing smoke. They are making mountains out of molehills. Frequently, they are high elected officials. I and other redundancy connoisseurs celebrate Parkinsonian redundancy as a sublime example of redundancy in its most aesthetically satisfying form. Of course, jobs are not at stake in this type of redundancy, because there is no job to do. There is only scurrying-around to do, and some people are simply superb at this. Superb! Have you ever known anyone who can take an inconsequential, stale, paltry, pitiful, unoriginal, alleged "idea" and turn it into a War To End All Wars? I have.

In its purest form, Type Five redundancy is a 68-page committee report that can be summarized in three simple declarative sentences.

Type Five:
Mindless Redundancy _____
Mindless redundancy is, well, mindless, and it is ... everywhere you turn! Whereas other types of redundancy have some sort of general lofty purpose (such as mollifying your auditors, turning your institution into a shambles, or routing your enemies), mindless redundancy is simply blather. It is the stuff of speeches that go on and on and project descriptions that go on and on. In its purest form, Type Five redundancy is a 68-page committee report that can be completely and accurately summarized in three simple declarative sentences.

Type Six:
Negative Redundancy _____
I coin the term "negative redundancy" to define the result of a vigorous organizational downsizing program that was so effective that the organization has been left without enough people to do the job. Of course, no one cares about this, because getting the job done is not the purpose of downsizing. The only purpose of downsizing is to reduce the level of office gossip in an organization. Unfortunately, this strategy is usually only partially successful. True, it reduces the number of gossipees—but the number of gossipers somehow always remains constant, as does the percentage of worktime hours devoted to gossip and the ugliness of the gossip itself (as measured quantitatively on' the Newcomb-Pratt SGSV Standard-Gossip Sheer-Viciousness scale).

Type Seven:
Recursive Redundancy _____
Type Seven redundancy is, as you might imagine, exactly the same as Type One redundancy—word for word, sentence for sentence, idea for idea. Rather than reproduce its description here, I will omit it, in order to save paper and ink, which, unlike information technology visionaries, are in short supply. Please go back now to Type One, and start re-reading. ■

Hot Issues 1995-96 ...

continued from page 3

are feeling pressure from top administrators to do so, primarily for public relations value. But in Web site purpose and design, there is some tension on many campuses between an institutional imperative to have an electronic point of contact and presentation for the public (especially potential applicants) and the more individualistic or creative desire to let a thousand flowers bloom without guidelines or constraints. On the brighter side, Web architecture may have finally provided an answer for questions about CWIS technology and design.

Access extension/capacity expansion. It is rapidly becoming an expectation that the campus LAN(s) and the Internet be accessible from, as many of our respondents said, "wherever students are." Modem pools and SLIP/PPP support are under growing pressure to expand to serve ever larger numbers of users when not on the campus network. Ubiquitous network connections on campus have not alleviated the demand for dial-up access. In fact, the habit of network usage seems instead to fuel demand for connectivity from wherever people work, live, or travel.

Dormitory wiring has quickly extended the scope of campus networks without a corresponding increase in support staff. There seems to be a never-ending need for more jacks, hubs, and ether-switches. The period of grace before 10mb shared ethernets will be overwhelmed may in fact be growing quite short.

Rising expectations. We may be victims of our own success. One IT administrator put it this way: "We've been selling technology for so long, and now that we don't have to—everyone is knocking at the door—we can't meet the demand." Three technological developments have brought upsurges in equipment and support demands in the past 15 years: word processing with the advent of microcomputers; e-mail in the age of the minicomputer; and now the Internet. But only the last of these presents itself as intimately connected to curriculum and instruction and has grown without any real need for active promotion. On a more philosophical plane, we are burdened by the expectation that there is a technological component to the answer for every problem people have. We—the campus technologists—may have inadvertently contributed to that perception.

We now need to presume that all students are likely to have had some Internet exposure before coming into higher education, and that they will count access among their basic expectations. But this prior experience might also mean they can be more self-sufficient with regard to net navigating than for other computing applications.

Another rising expectation is that electronic classrooms are in increasing demand by faculty and open a new category of expensive infrastructural building and renovation.

At some point, we seem to have crossed a divide after which everyone agreed that IT is essential to whatever it is that they do. Unfortunately, that demand has not always translated into new or redeployed resources.

Technical currency. This issue has both equipment/software and human expertise aspects to it. Keeping student and departmental labs at technical levels adequate to meet expectations is becoming an urgent challenge. The matter is complicated by the trend to decentralization, which has moved many of those labs out of the central support services' domain of responsibility, knowledge, and control. It is likely that a degree of "ownership" and sharing of responsibility with departments will be needed to accomplish this goal. Campus computing facilities are now too dispersed geographically and organizationally to be centrally maintained. The traditional assignment of responsibility for over-all technical currency has been with central computing services, but that model needs to be modified to include more local ownership of the task.

The aging of equipment takes on added urgency with the requirement that every computer be a suitable Internet navigator, as that criterion now defines the minimum expected at many institutions. Only a few years ago, an application with the platform requirements of Netscape would have been a niche concern. That network navigating (with multimedia capability) should become so quickly and solidly a part of the base-level functionality expected of any computer and network connection leads to unprecedented pressure for technical currency.

Return to training. Many respondents noted that a return to training is needed. Faculty and staff skills require upgrading, particularly if we are to realize any significant change in how people do their work. Basic "how to" instruction is no longer enough. Training needs to be extended to link instruction on the use of applications software with process and productivity issues. And in order to have a substantial effect on the curriculum and on teaching methods, training for faculty needs to include leading them to high-quality resources in their various disciplines. It is not enough to give a quick lesson on

Netscape to a group of faculty from disparate departments; they each need to be directed to some excellent content-sites.

Computing center staffs also need to re-tool in order to be useful for Internet and multi-media applications support. This need comes at a time when these staff are already at or beyond overload.

Role of the CIO. It may be harder than ever now to be a CIO. Caught between limited resources and rapidly growing expectations, CIOs are expressing frustrations and trepidation. One said, "I feel pressured from all sides... no relief in sight." Another noted, "We can rethink how we are doing things, but there is not much left to squeeze out in benefits." While none of the CIO respondents listed job distress as a hot issue, perhaps one in three volunteered worries and even anguish ("How long can I stand it?") about the nature of their jobs.

Generally, CIOs reporting strong campus planning processes appear to be less beleaguered, with a more manageable relationship between expectations and resources. When senior administrators are well acquainted with the dynamics of needs and costs in IT, a lot of pressure is lifted from the CIO and the staff. But when that understanding is absent, the CIO is left to gauge just how hard to push. Especially stressful is the divided nature of the role: expected by constituents to be an aggressive advocate for IT and by senior administrators to recognize the realities of limited funding.

Miscellaneous. The issue of whether to require students to own computers is again on the rise. Interest is being driven by several factors: the sense that academic and work-world use of the computer is now essentially ubiquitous; concern that not enough public-access computers are available or can be kept current; and the thought that privately-owned equipment would leave campus, taking with it the problem of obsolescence and replacement.

Acquisition and support of presentation graphics is growing urgent, particularly for faculty who would like to have an electronic classroom but must instead make do with a single computer and a projection device.

The impact of regulatory requirements on the programming workload in administrative computing departments was also raised as a concern. These have been building in number and severity over several years, with most recent concern centered on FASB changes. The trend is set against an already busy agenda that includes: software systems replacement, access demands by faculty and students, and revolutions in the underlying technical environment.

Past "Hot Issues": Less Hot ___
Some issues from the past three years have receded from crisis status. In some cases the needs have been met; in others at least the issue is well understood and now amenable to management; in still others the concern has been eclipsed. **Library issues**: after several years of featured attention, these are less often mentioned as hot; **administrative db systems**: like library issues, less often mentioned as hot but still on most agendas; **client/server**: hardly mentioned; **CWIS**: "solved" by Web technology (maybe). Where have all the kiosks gone? **TQM**: What? **focus on the customer**: now down to specifics where it qualifies as hot; **outsourcing**: hardly mentioned, and then without the fear and trembling once evoked; and **viruses**: blessedly absent from mention, despite last winter's epidemic of Internet hacking.

Thanks ___
Many people were kind enough to contribute their thoughts to this year's survey. Of particular note were the following: Charles Baumeister, **Alamo Community College**; Dagrun Bennett, **Franklin College**; David Cossey, **Union College**; Andrew Golub, **University of New England**; Barbara Horgan, **Seattle University**; Al LeDuc, **Miami-Dade Community College**; Mary Ellen Lyons, **Haverford College**; Charline Mahoney, **Merrimack College**; Don Medal, **University of Minnesota-Crookson**; Edwin Merck, **Wheaton College** (MA); Bethany Oberst, **James Madison University**; Claire Robinson, **University of South Florida**; David Smallen, **Hamilton College**; Chandler Whitelaw, **Southern Utah State**; and Dennis Witte, **Concordia University**. ■

In Future Issues

- *Current faculty attitudes towards technology and how to help them along*
- *Is multimedia fulfilling its educational promise yet?*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We're building a new health science center on our campus and are trying to decide the technology and media configurations for each of the spaces in the building. We've pretty much narrowed down our choices for the computer clusters, the labs, and the classrooms. What we're not sure about are the large lecture halls (seating from 120-150 students). Many faculty want to run data lines to each seat; others think that would be a waste of money. What's the current thinking on this?

A. *Data lines to each seat provide interactivity for each student. You need to determine how important that will be for 120-150 students at a time. In similar situations, most institutions have opted for the interactive mode of instruction for regular-sized classes (say, 40 students at the high end), with high-quality display for lecture halls. Even with a large number of students using computers during class, it seems more economical to incur the cost of the wiring, the labor, and the network support in a setting where interactivity can really make a difference to the learning process. You do, however, want to make sure that the display facilities in the lecture halls are very versatile, that is, capable of displaying computer screens, slides, video, and so on, from a variety of sources, all under the control of the instructor. A very helpful publication on building technology-enabled instructional areas is Campus Classroom Connections, published by the New Jersey Institute of Technology, (201) 596-8438.*

Q. We're getting a lot of pressure from the computer science faculty to upgrade the campus to Windows 95 right away. It's a clearly superior system to DOS and Windows 3.1, but I'm concerned about the cost of the upgrade beyond just the cost of the software.

A. *And rightfully so. There are some real support costs involved in upgrading, including proper installation, training, and so on. And that's not to mention whatever hardware upgrades—or replacements—you need to run the new Windows. You will, of course, have to upgrade eventually, but the decisions about when and how should be based on the answer to why. What are the specific benefits to be gained (other than just being technologically current), and at what point do they justify the total costs involved?*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

10/30/95 save for RIE

THE EDUTECH REPORT

October 1995

Volume 11
Number 7

The Education Technology Newsletter for Faculty and Administrators

Advanced Technology Groups: Essential or Indispensable?

by Howard Strauss, Princeton University

They work in the Skunk Works, the playpen, and the sand box. Everyone knows they get the best hardware and software while their colleagues make do with out-of-date discards. Their offices are palatial. Their spending would bankrupt Bill Gates. They are temperamental and out of touch with users. Instead of doing hard work like the rest of the IT organization, they have fun playing with their high-priced toys all day. And they get all the glory!

That's an all-too-common description of Advanced Technology Groups (ATGs). Despite such bad press, however, IT organizations keep forming ATGs. Unfortunately, ATGs are discarded almost as often as they are formed. Clearly, there seems to be a need to address today's explosive growth and change in technology by having some special group focus on coping with the problem, but somehow, most ATGs do not fulfill their promise.

Essential AND Indispensable

Were it not for the fact that these groups are essential, IT organizations could just stop trying to find the recipe for making them successful and get on with their pressing day-to-day problems. Many IT managers argue quite strongly that that is just what should be done. During a time of rapid technological change and very tight budgets, how can any organization justify allocating scarce resources that do not serve the immediate needs of users today? The answer, of course, is "tomorrow." Our users will be around tomorrow and if we plan to be there to serve them, we had better have the tools and services ready that they will need. The groups that are busy putting out fires cannot be planning the new more-fireproof homes to replace the ones that

continued on page 3

"Liberal education must rethink the privileged status of the book. This will require recognition of the printed book as a technology upon which the professional authority is built and a recognition of mass communication and digital information as primary cultural subjects which require critical attention.... Is the prestige of the book in liberal education fully consistent with its goals and content, or is it a justification for passivity and the isolation of the individual student?"

Peter Lyman
UC Berkeley
"What is Computer Literacy?"
Liberal Education
Summer 1995

NEWSBRIEFS

SMALL COLLEGE COMPUTING

The 29th Annual Small College Computing Symposium, to be held April 18–20, 1996 on the campus of St. Cloud State University in Minnesota, has issued a call for papers to enlighten its theme of "Making the Right Connection." The conference is being sponsored by St. Cloud as well as the College of St. Benedict and St. John's University. Technical papers in all areas of computer science, social science, academic computing, multimedia, and learning resource services are being sought, as well as reports describing new teaching innovations. Topics include, but are limited to, networking, software engineering, computer center management, expert systems, computer architecture, parallel computing, and campus policies and issues regarding computer services.

The deadline for abstracts is December 1, 1995. For more information, contact Randy Kolb, Academic Computer Services, ECC 101, St. Cloud State University, 720 4th Avenue South, St. Cloud, Minnesota 56301; (612) 255-4711; SCCS96@tigger.stcloud.msus.edu.

EDUCOM MEDAL AWARD WINNERS

Educom has announced three winners in the first annual Educom Medal Awards Program. The program, first announced at the Educom conference in San Antonio last year, seeks to reward and recognize individual efforts to improve the undergraduate learning experience through information technology. This year, Educom partnered with three disciplinary societies to determine winners: the American Chemical Society, the American Psychological Association, and the Mathematical Association of America.

The winners are Dr. Paul Schatz from the Organic Division of the Chemistry Department of the **University of Wisconsin-Madison**; Dr. Alan Lesgold of the Learning Research & Development Center at the **University of Pittsburgh**; and Dr. David A. Smith, Co-Director of Project CALC at **Duke University**.

Award winners will take part in an official awards ceremony at this year's Educom conference, on November 1 in Portland, Oregon. For more information, contact Educom at (202) 872-4200; info@educom.edu.

ON-LINE CONFERENCE FOR TEACHING IN THE COMMUNITY COLLEGES

"Innovative Instructional Practices" will be the theme for a fully on-line conference to be held April 2–4, 1996 by TCC (Teaching in the Community Colleges). Papers will be presented electronically, and participants will attend presentations via the Web, gopher, and e-mail. Participants will also have an opportunity to join open on-line discussions with presenters. Papers accepted for presentation will be published in the *TCC (Electronic) Journal*.

For more information, contact Anne Flanigan, annf@hawaii.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Advanced Technology Groups: Essential or Indispensable? ...

continued from page 1

burn down. Even in the worst harvest, or during the worst famine, some seed corn is saved for tomorrow.

ATGs, relieved of the necessity of dealing with today's problems (as they must be), have the time and budget to solve or avoid the problems that will hit the rest of the IT organization and its users in the future. They also have the time to focus on how to improve the services being offered today. If ATGs do their jobs effectively, they make the future easier to deal with for users and IT support people. Sure, the current IT organization is swamped. But it got that way—and will stay that way—by not anticipating and planning enough for the future. Of course it didn't plan for the future because it was too busy dealing with the present. But though the claim is made that if only the IT support folks had more equipment, more people, and more of other resources they could keep up, that is a self-serving myth. Building fireproof homes will do more to allow fire fighters to keep up than hiring more fire fighters or supplying them with more water. And users will be better served by having fireproof homes than by having the best fire fighters rescue them.

The Skunk Works

Having decided that the future must be dealt with, many organizations form an ATG based on the Skunk Works model.

Decades ago at Lockheed Aircraft, a group of free-spirited engineers led by Kelly Johnson was formed to design specialized aircraft for the U.S. military. The group, informally called the Skunk Works (the name was borrowed from the comic strip *Li'l Abner* by Al Capp), produced some of the most radical and advanced aircraft of our time including the U-2, the F-117A stealth fighter, and the SR71-Blackbird, still the fastest airplane ever built. To techies, the Skunk Works is revered, thus many managers attempt to duplicate its free thinking, creativity, and what seems like its great productivity.

In reality, however, the government used the Skunk Works to design a limited number of very expensive special airplanes to meet national emergencies. Since the premise was that not having these airplanes would imperil the very survival of the U.S., cost and protocol were not allowed to stand in the way of producing them. Were it not a question of survival, no one would have spent the huge sums of money and ignored all the regulations to build so few aircraft for such a tiny constituency. As a commercial venture, it would have put Lockheed out of business.

> *The groups that are busy putting out fires cannot be planning the new more-fireproof homes to replace the ones that burn down.*

An ATG is not formed to prevent the demise of a university. To an ATG, cost must be an important consideration and normal university rules must apply. While the Skunk Works operated outside the structure of Lockheed and the U.S., an ATG must work hand-in-glove with the rest of the university. It cannot afford to serve a narrow constituency like the Skunk Works. To justify its existence, an ATG's market must be everyone at the university, not just a few people interested in some arcane corner of technology. Every project attempted by an ATG must have a client on whose behalf the project is being done and those clients must have some stake in seeing the project completed. In addition, there must be a high-level commitment (e.g., the VP of IT) to have ATG projects supported by the IT support staff. Without such a commitment, the ATG will produce orphan software or will be diverted from its critical mission in order to market or support what it develops.

Many ATGs built on the Skunk Works model act like they really are the Skunk Works. Their managers and employees regale in the cutting-edge technology that they weave into incredible techno-gadgets that serve just a few clients or none. Those groups are irrelevant and doomed to failure.

The Two Faces of ATGs

If not a Skunk Works, what is an ATG? An ATG's function is to assess emerging technologies and based on those assessments, to design innovative applications and procedures which will improve the effectiveness and productivity of everyone at the university. That obviously includes students, faculty, and staff, but also includes the IT organization, alumni, prospective students, and other folks important to the university.

An ATG should encompass two functions which should be implemented as two separate groups.

continued on page 6

Howard Strauss is Manager of Advanced Applications at Princeton University.

The Strange but True Story of

by Richard P. Lookatch, Age

There is no evidence that computers and multimedia improve learning. Once more? Research to date on the impact of technologies on learning has never established that using a computer or any other technology improves learning. I have closely monitored the literature on teaching technologies since the bloom of computers in the classroom in the early 1980s and have yet to see a study that was without a fundamental flaw. It's called the "Type I Error," and it means the researcher has found benefits that aren't really there. Strange but true.

This Is Research?

Multimedia has become such a science that universities are now granting doctorates in what is essentially multimedia design and programming. Typically these degrees are called something along the lines of "Instructional Systems Design." Unfortunately, their graduates appear so narrowly educated that they know little or nothing of instructional design outside of that which is packaged in slick authoring systems. These same universities spend thousands of research hours on background colors, text style, acceptable video compression rates, etc.—a significantly greater "dosage" than that provided for research on instructional strategies exclusive of media.

Experimental design is a critical component of scholarly research. It also appears to have taken a back seat to the latest fashions in media. When I hear paper presentations, I am often puzzled by the failure of the new Ph.D.s to use such basics as: true control groups; pre-tests that enable the researcher to equalize individual differences among subjects when crunching the numbers; and failure to control for a whole myriad of confounding variables. Whatever happened to true experimental design?

Case in point. Throughout the first part of this century, some misled psychometricians revealed that, as indicated by a variety of instruments, members of lower socioeconomic status and members of certain racial groups were of inferior intelligence. The *data* was there; unfortunately, the *design* wasn't. Dangerous? Yes. These studies proved nothing and could have been avoided had they been properly designed. At best, they damaged the perception of those identified as "inferior"; at worst, they fostered racism and class envy. They were fundamentally flawed in that they failed to control for a host of environmental experiences and conditions that contribute to test performance of any kind, extraneous factors that could account for the observed differences.

The flaw in the research on multimedia's impact on learning—for it is flawed—is much like that. Just as those misled souls failed to control for environmental differences (perhaps an impossible task), many multimedia researchers to date have also failed to control for a host of conditions that may account for the observed impact on learning. And this flaw leads to their Type I Error.

A typical research design on the impact of multimedia pits a videotape version of an instructional lesson and a non-media classroom version against an interactive multimedia version. Comically, the traditional classroom version is often referred to as a "control group." In reality, there typically is *no* control group—certainly not one that would help assure that differences are attributable to the treatment rather than to some extraneous variable. There is no pre-test to account for individual and resulting group differences at the onset, differences that may influence the statistics. Rather, the assumption is made that because there are 20 or so students in each group, any differences would "average out."

A Matter of Dosage

But there is an even bigger problem. The typical study described in the multimedia research parallels a pharmacological study in which a new drug is tested, with the exception that the multimedia research study often *excludes* a true control group while the pharmacology industry has the sense to include one. A drug is tested at three significantly different dosages, though the vehicles of delivery are identical (for example, the same-looking pill). Surprise: The group receiving the highest dosage experiences the greatest effects! Unfortunately, our multimedia researchers lack the insight to see that their dosages (of content and instructional strategies) vary significantly from one experimental group to another—in other words, from multimedia group to classroom group. Typically, the multimedia group receives either more content or content for which greater care was taken in its preparation. And with average development costs of CD-ROMs in the $700,000 range, rest assured that the latter difference is common. The difference in preparation of the teacher is glaring.

Richard Lookatch is an educational psychologist with the Agency for Instructional Technology. *This article appeared originally in the Summer 1995 issue of Technos, and is reprinted with permission.*

BEST COPY AVAILABLE

ultimedia and the Type I Error

for Instructional Technology

To add to the confusion, the contexts in which most media studies are carried out are so complex that researchers cannot possibly control, and are likely unaware of, all the variables in the environment that might affect the results.

The Myth of Multimedia Benefits

There are no unique educational benefits from multimedia or its attributes. Once the information content and instructional strategies are controlled for, the differences will disappear. Such controls are absent from multimedia studies revealing benefits of the medium. The motivational effects and preferences of multimedia often cited in studies are a charade as well. What occurs here is blind belief in a new and novel machine, a machine that students find more interesting and easier to accept than a talking head in front of the class. It is not, however, the machine that motivates. Rather, it is curiosity, content, and instructional strategies that motivate the learner.

Economics of Multimedia

There is no mediated program that cannot be mediated by an alternate medium. Unfortunately, the battle between fashion and efficacy seems to have been won by fashion. Today it is fashionable to "do a CD-ROM" with little regard for other less expensive methods (such as print). What is puzzling is that the question "Can it be done cheaper using other forms of mediation?" seems to be routinely overlooked by developers. Fashion seems to have won out even over economics.

Clearly, there are applications for which multimedia has the most efficacy. But even in these cases, the advantages are economic. For example, it may be a lot less expensive to use a flight simulator than hands-on flight training for pilots. But the advantages *are* economic—time, cost, liability—not learning-oriented. Conversely, I seriously question the use of multimedia to supplant hands-on classroom science experiments or simple dissections in the biology lab. A computer simulation is clearly neater, cleaner, and easier, but it is not an experience. The true experience occurs on the lab table.

Dangers of the Type I Error

The Type I Error—finding benefits that are not really there—would seem to present education with a panacea: a path to equity, efficacy, and high SAT scores. The reality, in stark contrast, is that the Type I Error will lead to inequity, either in lower scores or lower standards, and wasted financial resources.

Clearly, multimedia is not the great equalizer. The same groups indicated by the IQ research of the first half of this century will be impacted similarly by the multimedia panacea. For example, access to technology is clearly inequitable and will continue to be so for the foreseeable future; poor urban and rural school systems do not now and may never approach the access to technology resources afforded well-financed systems.

A second consequence of the Type I Error is the resulting misdirection of resources toward applications that may be better served by cheaper, less fashionable instructional strategies such as field experience, role playing, and print-based works. Furthermore, misappropriating resources to multimedia projects better or equally served by other instructional strategies leaves fewer funds for those projects best served by multimedia.

Yet another outgrowth of the Type I Error is the blind thirst for multimedia at the expense of instructional design. The ultimate consequence will be poorly designed yet flashy, fashionable, and entertaining instructional materials—great baby-sitters but poor teachers.

A Matter of Semantics

Is this treatise merely a matter of semantics? Some may view it as such. However, careful reflection can only lead to the conclusion that multimedia and a host of other technologies are fast becoming the new educational panacea. But we must avoid the Type I Error.

Some instructional strategies are well suited for multimedia and other technologies; simulated outcomes of decisions impractical to experience live, literature review, and data collection are a few examples. Though any of these could be accomplished using other media, multimedia and on-line technologies are clearly more efficient and economical with little if any experiential cost. However, for each well-guided application, there is a host of misapplications.

Media clearly enables us to design better instruction. For the past 30-plus years, film and video have brought the world into the classroom. Unfortunately, we relied on film and video to bring the community into the classroom rather than the class into the community. Multimedia provides the opportunity to interact with the images behind a glass screen. Let's hope we don't let it replace interaction with each other. Multimedia and other technologies are simply tools that assist with instruction. They have no more influence on achievement and wholeness than a scalpel has on healing. ■

BEST COPY AVAILABLE

Advanced Technology Groups: Essential or Indispensable? ...

continued from page 3

One group, the Technology Assessment Group (TAG), studies emerging technologies and assesses their applicability to current and future university needs. Of course their constituency is the entire university, but a very important client of theirs is the IT organization itself and particularly the Innovative Application Development Group (IADG), the other part of an ATG.

While the TAG looks at hardware, software, and protocols (e.g., OLE, OpenDoc, https) it does not duplicate the services of the scores of technology publications that evaluate hardware and software and assess the future. The TAG examines emerging technologies (e.g., speech recognition) and decides if, where, and how they might be used at the university. The TAG might recommend the technology be used in an existing system, a future system, that the technology should be watched for future development, or that it be avoided. The TAG collects recommendations, information, and references to information and disseminates them to its clients. While the TAG must be proactive, poking its nose into every corner on its own initiative, it must also be responsive to requests from any of its clients.

The IADG

The IADG develops applications that are leading-edge, specifically for the university. It serves everyone at the university, though particular applications might serve a small subset of that market. Applications developed by the IADG are characterized by providing higher levels of utility, service, convenience, performance, security, and/or cost effectiveness than were formerly available.

The projects that the IADG takes on often alters university policies and procedures. For example, the IADG might explore charging for laser printing, accessing transcripts remotely, giving field personnel access to alumni gift information, extending fiber optic cable to dorm rooms, adding secure digital signatures to forms so they can be authorized on-line, or making distance learning more effective.

Who Does an ATG Work For?

Of course an ATG works for the entire university, but it is almost always part of the IT organization. Its projects must come from the creativity of its own staff, the IT organization, and university users.

> *An ATG must have a very strong user orientation and must believe that cutting-edge service is far more important than cutting-edge technology.*

Having any one of these groups dominate the flow of projects will sink an ATG.

It might seem that university users should determine exclusively what an ATG should do, but users are better at understanding their current problems than knowing how to solve them. And they are notoriously bad at understanding the products they need for the future. Users did not demand microprocessors, anti-lock brakes, ATM cards, fluoridated water, or the World Wide Web, but there turned out to be great utility and huge demand for those things. ATGs must uncover those undiscovered products and services that their users want but don't know how to ask for, and deliver them. As a result, ATG employees must be creative, committed, savvy, technical people that are tuned into and sensitive to users' needs. It won't do to hire a bunch of stereotypical techno-nerds, put them in front of their UNIX workstations, and see the super-cool hacks they turn out that are only understandable and useful to their peers. An ATG must have a very strong user orientation and must believe that cutting-edge service is far more important than cutting-edge technology.

ATG members should serve on IT committees and task forces and should be a resource to other IT groups who find themselves struggling with technologies in which an ATG has some expertise. What must be resisted, however, is to distribute the ATG so that each IT group has an ATG person, or that the ATG group is really part of some other IT group such as MIS. ATGs must also avoid being committed to work on projects that are little more than helping other IT groups do their day-to-day work. An ATG must not become a supplier of techno-temps.

Creative Independence

An ATG must have its own budget, its own equipment, and its own people. Its budget and its charter must commit it to building the future of IT at the university, not managing the store. The temptation to not save or plan for the future is so strong that unless planning for the future is forced by strong organizational structures, it will not happen. Tomorrow will be raided to take care of today. In the long run, the result is that the IT organization will not survive.

An ATG must also have the budget to fail. Not every project it builds or technology it examines will have

great value to the university. Some will have none. Edison did not discover the correct kind of materials to make the electric light bulb on the first try. If he had been told that he had the budget to try only three different kinds of materials, you might be reading this by the flickering glow of a gas lamp.

Now and again an ATG will have a project run into a wall. Maybe the technology isn't quite ready or users don't quite yet have the computing power necessary. Is this money wasted? Almost never. In doing such a project, an ATG improves its grasp of relevant technologies and documents what it was able to do, what it couldn't, and what it learned. The project is put on the shelf, not discarded. If the conditions that prevented its success change, it will be pulled off the shelf and revived.

Having an ATG is not inexpensive. An ATG requires what often appears to be excessive hardware and software (but these "toys" are the power tools that will be used to fashion the future). It also requires talented people who must be nurtured and rewarded. If they are the right people, an important part of that reward will be the opportunity to work long hours on different kinds of equipment with great software tools building new applications for grateful users—and working with peers with the same value systems and expertise.

A Look Into The Future

It seems to many skeptics that if a university had no ATG, the future would arrive anyway. Maybe the future would take a little longer to arrive—perhaps a year or so—but is the expense of an ATG worth having technology sooner? And if the technology really does arrive a year sooner, won't it be less ready and more difficult to deal with?

An ATG does not help the future along. Unfortunately, the future always arrives without our help a little before we're ready to give up the present. An ATG anticipates the future and enables us to better capitalize on what it brings. By getting technologies in place early, an ATG gives us more time to adapt and to change our structures to meet the changing times.

Fortune Cookie

I recently opened a fortune cookie that said "The greatest pleasure in life is doing what people say you cannot do." In the sense that it is a great joy to do new things that skeptics think are impossible, that is something that ATGs delight in doing. But many critics interpret that fortune to mean that an ATG takes great joy in doing things it shouldn't do, such as destroying the status quo and devaluing skills that took years to acquire.

That is the difficult role an ATG must play—it must be the agent of change. An IT organization will not survive if it does not change. But change is disruptive and unsettling. An ATG plays the essential and indispensable role of challenging us to do better even when we know we are doing the best we can. It dares to question our basic truths and forces us to leave the security of the past. Only by doing so will we be around to celebrate the future. ■

"No objective observer will deny that the environment for higher education has changed and that institutions have responded in a variety of ways. But many educators have acted as though the only changes have been in the availability of resources and eroding public support caused by difficult economic times. They have failed to grasp the profound significance of the demands of the Information Age and their impact on the fundamental patterns and cadences of learning."

Michael G. Dolence and Donald M. Norris
Transforming Higher Education: A Vision for Learning in the 21st Century
Society for College and University Planning
1995

In Future Issues

- *New information systems: don't pave the cow paths*
- *Top-level support: the single most critical success factor*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We have a new president at our school, and she has noticed that the state of our administrative information system is rather dreadful. We are, therefore, in a big hurry to acquire a new system, and have even decided to hire a consultant to speed us through the process. How long should we expect to take on this?

A. *A typical administrative software selection project will take anywhere from five or six months (usually the minimum) to over a year, depending on the availability of folks at the institution to work on the project. The best selection process is a highly participative one, including both the faculty and the students along with what we think of as "traditional" administrators. While this can make for a more lengthy selection process than if just one or two people were to do the whole thing, it will lead to not only a better result in the end, but also serve as a foundation for the system implementation. Even working with an outside consultant does not preclude the need to have campus people substantively involved at every step. The president is, no doubt, fully aware that a new information system is a big step for the institution to take, and if done right, will result in a solution that will last for many years. Both its cost and impact demand a careful process, even if it takes a bit longer to accomplish.*

Q. Our college is looking to start up a Web site, but I currently do not have anyone on my staff who has the time to dedicate to this. It will also take them some time to develop the right skills. Is this something that could be outsourced?

A. *Yes, and many organizations, not just colleges and universities, are doing just that. In fact, the outsourcing options range from designing and creating Web pages to hosting the Web site itself, with many other services available as well. The October 16 edition of Computerworld had a good article about this, and listed the names of several companies that provide these services. Given the extremely high interest in the Web, along with the increasing necessity of having a Web presence, for smaller institutions or for those with very tight resources, outsourcing is an option worth exploring, even if it is just a temporary solution.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

RIE

THE EDUTECH REPORT

November 1995

Volume 11
Number 8

The Education Technology Newsletter for Faculty and Administrators

Retrofitting Academe: Adapting Faculty Attitudes and Practices

by LeAne Rutherford and Sheryl Grana, Univ. of Minnesota

The Chinese character for "risk" combines under one roof the symbols for uncertainty and opportunity. If postsecondary education is to succeed, it will have to take the risks, and overcome the fears and uncertainties caused by change to avail itself of unprecedented opportunities presented by technology. Faculty, often gatekeepers of knowledge, must seize the moment. This means adapting their attitudes and remodeling their practices to retrofit academe.

Changes in the Classroom

In many classrooms where emphasis has shifted from teaching to learning, transformations have been occurring that take some adjustment. Learning is becoming more active and less authority-dependent. Pushing lecture to the side, other educational strategies that actively involve students are being used to enhance learning: case studies, cooperative learning, debates, peer projects, and collaborative endeavors. Technology both mandates active learning and assists it. No matter the form, the ultimate goal for these multi-dimensional methods is to create students who can function independently and think critically.

Reaching such developmental goals has never been easy. Students may resist these new methods, preferring that faculty give them the "right" answers. Some faculty may resist because, never having had instruction in how to teach, they teach only as they themselves were taught (which for many means exclusively lecturing). Vacating the stage to become a facilitator rather than the font of learning may seem counterproductive and rather bland. Finally, issues of control surface. However, although many faculty have adapted, retrofitted, and remodeled their teaching, it is time to do more.

continued on page 4

"Early in this century, John Dewey, the great American philosopher, talked about education as experience. Dewey identified the two primary characteristics of an effective educational experience—interactivity and continuity. When he had the vision, we did not have the tools to implement that vision. But we do have the tools today.... So it really is incumbent upon all of us now to take those tools and achieve a curriculum of continuity and interactivity that makes for truly effective teaching and learning experiences for our students."

Judith Boettcher
Pennsylvania State University
"Technology Classrooms, Teaching and Tigers"
Syllabus
September 1995

NEWSBRIEFS

TRANSFORMING HIGHER EDUCATION

Transforming Higher Education: A Vision for Learning in the 21st Century, by Michael Dolence and Donald Norris, is a new publication from the Society for College and University Planning (SCUP). The authors, both of whom are consultants for strategic planning and organizational transformation, contend that the needs of learners are changing very quickly as technology becomes more ubiquitous, and that higher education must adapt to these changing needs or risk becoming irrelevant. The 100-page monograph contains suggestions for establishing a framework for transformation, learning vignettes from the Information Age, and a discussion of the importance technology and networks will play in the transition to a globally networked learning organization.

The cost of the publication is $25 for SCUP or CAUSE members, $40 for non-members. Volume pricing is also available. Contact SCUP, 4251 Plymouth Road, Suite D, Ann Arbor, Michigan 48105; (313) 998-7832; scup@umich.edu. It can also be ordered through CAUSE, orders@cause.colorado.edu.

WORLD CONFERENCES ON EDUCATIONAL TECHNOLOGY

ED-MEDIA 96, the World Conference on Educational Multimedia and Hypermedia, and ED-TELECOM 96, the World Conference on Educational Telecommunications, to be held June 17–22, 1996 in Boston, Massachusetts, are annual international conferences which serve as multi-disciplinary forums for the dissemination of information on the research, development, and applications of these technologies for all levels of education. The conferences are sponsored by the Association for the Advancement of Computing in Education (AACE) with local assistance from surrounding colleges and universities.

The conferences will have papers, panels, roundtables, tutorials, workshops, and demonstrations. For more information, contact AACE, P.O. Box 2966, Charlottesville, Virginia 22902; (804) 973-3987; aace@virginia.edu.

IN TUNE WITH TECHNOLOGY

"In Tune With Technology" is the theme of the 1996 CUMREC conference, the 41st Annual Conference of the College and University Computer Users Association, to be hosted by Vanderbilt University. The conference will be held at the Opryland Hotel in Nashville, Tennessee on May 5–8, 1996 and is the longest continuing conference devoted to promoting the understanding and use of information technology in higher education.

The purpose of the conference is to provide a forum for higher education professionals to share their experiences and expertise with computer systems. It is an opportunity to share success stories and network with other higher ed professionals. For more information, contact Wayne Brown at Vanderbilt, (615) 343-8367; brown@uansv3.vanderbilt.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

TLTR: The First Year and Beyond

by Steven Gilbert, American Association for Higher Education

Today most colleges and universities are already effectively using information technology to improve institutional operations, support many kinds of research, and increase personal productivity. Many institutions have already made major investments in a technological infrastructure and are beginning to realize that this is an ongoing or rising expense. There is a growing belief that a major commitment to attractive educational applications of information technology can improve the quality and accessibility of education for many students and permit an institution to compete more effectively for students and faculty members.

Most colleges and universities already have at least one committee wrestling through a technology planning process. But these efforts often lack a coherent conceptual framework, focus too narrowly on the technology rather than the teaching/learning issues, and involve only those already closest to the technology. The usual campus fragmentation—lack of communication, coordination, and collaboration among the key support services—undermines the effectiveness and efficiency of efforts to encourage faculty to develop and implement new educational uses of information technology.

The AAHE Teaching, Learning, and Technology Roundtable (TLTR) Program provides a compellingly simple common-sense approach and the coherent conceptual framework needed to address these issues. Developing a local TLTR can build better collaboration, communication, and cooperation to improve planning, policy making, and implementation. It can help institutional leaders organize, think about, and select among options, and develop strategies to improve teaching and learning through the integration of technology.

During the TLTR Program's first year almost 200 institutions began the TLTR process. In July, 1995, the first national AAHE TLTR Start-Up Workshop was held, with more than 160 people in teams from more than 60 colleges and universities. Based on the remarkable success of that event, regional versions of it will be offered.

> *Campus fragmentation undermines the effectiveness and efficiency of efforts to encourage faculty to develop and implement new educational uses of information technology.*

TLTR Regional Start-up Workshops

A TLTR Regional Start-up Workshop offers training for teams from institutions wanting to develop and launch their own TLT Roundtables. Plenary sessions introduce concepts and examples. Facilitators with Roundtable experience work with peer groups of teams on developing plans and materials tailored to the special needs and characteristics of each institution represented. The AAHE TLTR Institutional Planning Grid and related materials are distributed, and training in their use is provided.

Each team will be helped to develop plans for its own TLTR goals and objectives; the appropriate composition for its Roundtable and how it will work with other organizations within the institution; a set of implementation strategies; effective faculty support service combinations; a directory of local "best practices" of faculty use of information technology, support services and resources to help faculty improve teaching and learning with information technology; and a subcommittee structure and work plans for the first year of the local Roundtable.

Options for Participation

An institution can choose to be a "host institution." to provide meeting space, related facilities and equipment, food services, etc. Especially if the host is the site of an "experienced" Roundtable, individuals from there are encouraged to participate as facilitators.

Another option is to be a "collaborating (co-sponsoring) institution." Each regional workshop is structured to match two to five teams from "peer" or nearby institutions together as they work through the training tasks. In addition to developing plans for their own institutions, teams also establish (or extend) collaborative relationships and make specific plans to visit each other's campuses and develop other inter-institutional activities to enhance their local work.

Further information is available from Ellen Shortill, (202) 293-6440 ext. 38; shortill@clark.net. ■

Steven Gilbert is the director of technology projects at the American Association for Higher Education.

Retrofitting Academe: Adapting Faculty Attitudes and Practices ...

continued from page 1

Adjusting Roles, Redefining the Destination

Traditionally instructors have been the entrance to information. If not the gate, then surely they were the gatekeepers. They have had control over the terms and facts of the subject matter. They have had control over the input, the throughput, and the output. Exit control. Enter technology.

Enter access to so many facts and so much data that Solomon could not deal wisely with them. Enter the Information Age. Enter changing faculty roles and a burgeoning knowledge base pointing to the need for information literacy in an information age. Faculty will have to renovate attitudes, refurbish frayed pedagogy, and rewire old circuits to accommodate all of these technologically inspired changes.

All institutions are currently wrestling with architectural questions of what technology, how much technology, which technology, for whom, and at what cost. Electronics is the common denominator.

Faculty members, who will live in "this old house" through the chaos of retrofitting, understandably worry. They worry about getting enough tools and equipment to function comfortably, enough time to retool and reorganize, enough training in technological mechanics and methods to feel in control, and enough tolerance for change to get through this massive and messy alteration. Above all, faculty often have fears that may prevent them from adapting.

LeAne Rutherford and Sheryl Grana are assistant professors at the University of Minnesota-Duluth. *This article appeared originally in the September 1995 issue of T.H.E. Journal and is reprinted with permission.*

What Can Prevent Faculty from Adapting

The following issues that concern faculty, while not an exhaustive list, illustrate what may prevent instructors from learning and using new technologies.

Fear of change: "I've come this far in my life without needing this technology, so why do I want to learn now?" Explicit or implicit, fear of change is part of the human condition; the unknown is frightening. In the long run, however, not adapting is suicide.

Fear of time commitment: "How can I spend the time necessary to deal with this stuff? I just don't have the time to spare." Many simply feel they cannot afford the time to learn new procedures or techniques. Others may fear that spending a short period simply leads down a slippery slope to longer periods, or that other work will suffer. Committing time to learning technology means it is being taken away from something else.

Fear of appearing incompetent: "What if I look like a fool? I don't want my colleagues or students to think I can't do this!" Human fears of appearing incompetent or silly keep many of us from doing a number of things: singing in public, for instance. Faculty may hesitate to try a new computer skill for fear of bumbling.

Fear of techno lingo: "What's an 'FTP' site? All those acronyms are beyond me: TAPI, PCI, IDE.... What is 'hypertext,' a 'home page,' 'native signal processing'? And 'flaming,' what's that?"

Fear of techno failure: "What if I try technology and it fails me? The message I sent via e-mail came back, 'host unknown.' Where do I turn if I get stuck?"

Fear of not knowing where to start: "Where to start? How to start? What's most urgent to know? Most important? Most significant?" Retrofitting for the new world of technology is like thinking about remodeling a house. Start in the bedroom or the kitchen? Rewire or replumb first? With so many tasks to do, deciding where to start is a major impediment.

Fear of being married to bad choices: "What if I buy the computer equivalent of an Edsel? These choices are big-ticket items." While making technological choices may have greater consequences than selecting paint colors, not making any decision at all makes a decision by default. Moreover, waiting for something better to come along is futile. Something better is *always* coming along.

Fear of having to move backward to go forward: "What good is a computer keyboard to me? I don't type." If faculty haven't learned a skill—one now necessary to efficiently use technology in academe—then part of their fear of technology is really the lack of knowing a needed skill.

Fear of rejection or reprisals: At all cornerstones of life, rejection can be found. Not retrofitting due to the possibility of backlash is analogous to not searching for a mate. Those who don't look, often do not find.

Tips to Help Shift One's Perspective

"I've lived this long... I don't have time... Where to start... What if... What if... What if...?" Overcoming fears, real or imagined, takes a shift in perspective. The following suggestions will aid in making that shift.

Be Realistic. Technology is here.

Money is following it. The Annenberg/CPB Project, for instance, has set aside $2 million for two initiatives, one of which is for research on "how courses are changing in response to student use of technology and how faculty rethink courses accordingly." Job announcements now frequently contain clauses that indicate candidates must be attentive to the "rapidly evolving incorporation of instructional technology into the teaching/learning environment" (excerpt from a recent ad for a faculty position).

Faculty who have access to technological resources but do not use them are stigmatized. Luddites didn't succeed in discouraging the Industrial Revolution; faculty who refuse to read their e-mail won't succeed in discouraging the Information Revolution either. Furthermore, instructors who wait for institutional norms to change before they incorporate technology into their teaching will have waited too long. Jumping on the bandwagon is harder these days because the bandwagon is a Concorde jet.

Being realistic means accepting that trouble and time are both involved. Electronically mediated aids to communication are not necessarily labor-*saving* devices. They are labor-*changing* devices. Technology does not avert the task, but it can transform how it is performed.

Decide who's boss. Instructors must decide what it is they want to accomplish in their classes. Then they can start to get their arms around how technology can help attain those goals. Contrasting the role of technology with the role of instructional objectives, the dichotomy is message vs. medium, means vs. ends, master vs. servant. Technology is a medium, a means, *and* a servant. But keep in mind that while certainly magical at times, technology is not an elixir for curing all educational ills.

Ease into the technological flow. All instructors have used some technology in the past: test banks on disk, camcorders, VCRs, overhead projectors, etc. They can build on that experience and the confidence it inspired. Instructors need to remember that what they will be doing is an extension of what they have done before. Gaining technological competence is truly gaining literacy—an incremental process.

Become familiar with techno-culture. Read catalogs from software companies, ed-tech journals, manuals, trade "rags," and instruction books even though they may not be totally comprehensible. Tune into PBS "Computer Chronicles." Encourage your libraries to subscribe to publications with electronic thrust. Let the language wash over you until it no longer seems foreign.

Sign up for teleconferences, but be tolerant when teleconferences are too long, too technical, too much. Learn about conferences, institutions, and institutes for teletraining that address your instructional needs. Workshops held on-campus, too, can orient faculty to institution-specific electronic facilities.

Play. Faculty are often too hard on themselves. Many expect instant success and total perfection in their attempts at technological innovation. They need to give themselves permission to try, fail, and try again.

Network with others. This is not time to be the Lone Ranger. Bring up technological experimentation in conversations—over lunch, in the corridors, on e-mail. Look to see who has home pages on the World Wide Web. Find out who is innovating and activating their classes. Talk with them. Ask if you can visit their classes.

Networking must occur personally—faculty member to faculty member. However, other partnerships have to be created and other links forged. Compartmentalization has to decrease. Tidy institutional boundaries will have to blur and disappear.

For synergistic effects to occur, more faculty must become involved with cross-curricular, pan-institutional committees such as our Instructional Technology or Distance Education Teams. Furthermore, faculty must work with administration to gain their understanding of resources needed for educational remodeling.

Reverse roles. Students are often more technologically sophisticated than instructors. Their expertise can be tapped with dynamic results and doubled rewards. By reversing roles with the instructor, not only do students become involved with conquering the content in question, but their learning relationship with the instructor shifts toward cooperation and egalitarianism, thus enhancing learning.

Final Thoughts

More than tweaking teaching with technology but less than using the wrecking ball for total demolition, retrofitting involves considerable turmoil. Back to Chinese, the character for turmoil pictures three women under one roof. In higher education, the ideograph for trouble might depict teaching, technology, and change under one roof. Since it is unlikely that any of these three occupants will move out, to achieve harmony, the academic residence must be remodeled and practices and attitudes adapted. ■

Picking the Right Administrative System

It used to be that picking a new administrative information system was easy. One person on campus, usually either the financial vice president or the computer center director, figured out what the campus needed, looked at the vendor choices, did a little negotiating, and then picked one. Things are a lot more complicated now. Not only are there many more options to choose from—and not just vendor options, but also technologies, architectures, and features—it is also now a more participatory decision on the campus, requiring much more communication and coordination.

The process, however, does not need to be overly cumbersome or time-consuming. And if done well, it can result in a cost-effective system solution for the campus that will last well into the future. The key is staying focused on the important issues and being well organized. The basic process should be highly participative and consist of determining what the campus needs are (including features, tools, and technology), establishing the criteria for making the system decision, becoming as educated as possible about the choices, and then just doing it.

The first step is to begin by setting up a campus-wide common set of expectations. This can be done, for instance, by holding an open meeting, offering an overview of the entire process of selecting a new system, including what the benefits are likely to be, what the costs will be, who should be involved at which stages, how long it may take, and what challenges will probably be met along the way. This sort of presentation is helpful both to institutions that have never been through the process before and ones that do have experience, although perhaps not a positive one. The point is to get everyone involved to have the same set of expectations right up front.

The next step is to form a committee, or a task force, charged with the responsibility of selecting a new system. The committee should be made up of principal director-level administrators, faculty representatives, and possibly, a student or two. Many campuses also form an Oversight Committee; this would be at the vice-presidential level and in place for the purpose of sanctioning and endorsing the selection committee's activities. The Oversight Committee would attend certain of the selection committee's meetings and otherwise be on hand to provide support to the process.

If done well, the process can result in a cost-effective system solution for the campus that will last well into the future. The key is staying focused on the important issues and being well organized.

Once the committees are in place, the needs analysis can begin. This is the most critical step, since the needs analysis is the cornerstone for a successful project. It should be a widely participative process, although it can certainly be accomplished quickly and efficiently. Needs should include not just system features and functionality, but also the user interface; tools that should accompany the system, such as a report writer and query language; support, including documentation and training; and the underlying technology. Once completed, the needs analysis will serve as the institution's basic criteria set for all of its subsequent system decisions.

The needs analysis can then be turned into a formal Request For Proposal, to be sent to vendors of higher education system software. It can also be given to the in-house computer people so that a determination can be made at this stage, if it has not been already, of the relative cost-effectiveness of the build-or-buy options. Vendors generally need four to six weeks to provide a good response to the RFP, so during this period of relative quiet, the selection committee can begin discussing issues that will affect the implementation later on, such as data access policies.

The next step is to evaluate the vendor responses once they are received; this should be a fairly straightforward and objective process, using, for instance, simple criteria lists covering overall system functionality, end-user tools, underlying technology, stability and financial outlook of the vendor, and so on.

One of the key tasks at this stage is to arrive at a consensus among the committee members. This is not as hard as it sounds, especially if the focus is on the institution itself. Even though they are representing specific departments or areas of the institution, the committee members should be continually encouraged to look at the system choices from the institution's point of view. This evaluation should result in a ranking which

can be used by the committee to select a "finalist" group of two or three systems.

The process now moves from objective evaluation to a somewhat more subjective process. Each finalist vendor should be invited to campus for three or four days to demonstrate the system being proposed. Everyone on campus should be invited to these demos, and the vendor should be given a script to follow representing the institution's most pressing needs and concerns. Not everyone, of course, needs to attend the entire demo (although the selection committee members should be there as much as possible); the vendors will work with the institution to publicize the schedule beforehand to give campus people the opportunity to pick and choose.

Other information-gathering tasks at this stage should include peer-to-peer reference checks, visits by committee members to other schools using the same system, and a visit to vendor headquarters. The goal here is to become fully educated about the various choices.

At this point, the committee, representing the views of the entire institution, should have enough information to make a solid, consensus-based decision. Again, broadly based criteria, such as overall fit with the institution, total acquisition costs, support services quantity and quality, and so on, should be used.

And again, it is very important to make this decision with the overall institutional best interests in mind. It may mean that the institution will acquire a system that is not the absolute best for individual offices; it will, however, ensure that the institution's needs as a whole are met in the best way.

Before the administration, or the Oversight Committee, if there is one, puts its stamp of approval on the decision, the institution should go through contract negotiations with the chosen vendor. It is important to do this before the final decision is made, especially if the decision has to go before the Board, so that the institution has a fall-back position in case the negotiations don't work out. This is rare, but it does happen.

The whole process can take anywhere from five or six months to a year, and if followed as outlined above, almost always results in a universally acceptable and accepted decision. And not only has the institution thus assured itself that it has made this very important and expensive decision wisely, it has also laid the most effective foundation for a successful implementation. ■

"In the past, people came to the information, which was stored at the university. In the future, the information will come to the people, wherever they are. What then is the role of the university? Will it be more than a collection of remaining physical functions, such as the science laboratory and football team? Will the impact of electronics on the university be like that of printing on the medieval cathedral, ending its central role in information transfer? Have we reached the end of the line of a model that goes back to Ninevah, more than 2500 years ago? Can we self-reform the university, or must things get much worse first?"

Eli Noam
Columbia University
"Electronics and the Dim Future of the University"
Science
October 13, 1995

In Future Issues

- *New information systems: don't pave the cow paths*
- *Top-level support: the single most critical success factor*
- *Using technology to create a student-friendly campus*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We're a small college, with a very personal flavor that our students appreciate very much. Our computer system does our basic data processing, but not much else. We're beginning to hear about things on other campuses like student information kiosks and faculty entering grades into the system directly, and are wondering if this would be appropriate for us to consider.

A. *The trend on every campus today is to open up the administrative information system. This is very consistent with the wider world of information; as we all acquire increasing electronic access to banking functions, shopping, our credit records, our investments, our consumer records, and so on, it is understandable that campus people, including students and faculty, want similar access to campus information. While we certainly would not suggest that your information system be wide open to all under all circumstances, providing such things as access for the faculty to the academic histories of the students they are advising and access for the students to their own academic and financial records should be a highly placed agenda item for the institution. Of course, there are security concerns here, and a set of policies governing who can see, and who can change, which data under which circumstances will have to be worked out, agreed upon by all of the relevant parties, publicized, and enforced.*

Q. We're about to begin a strategic planning process for information technology and we thought the right place to start would be to do an assessment of our current IT situation. Any suggestions?

A. *An assessment is a good place to start on the planning process, but you need to do it right in order for it to be a really effective tool. The first thing to work out is the definition of just what you're going to assess. One of the traps that institutions often fall into is in thinking that the only task in assessing IT at the institution is to give a performance review to the department responsible for delivering IT resources and services. While that is one component, it is far from the whole issue. The real value in an IT assessment is the understanding it produces of how the whole institution is dealing with technology. A thorough assessment should look at the whole picture.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

THE EDUTECH REPORT

December 1995

Volume 11
Number 9

The Education Technology Newsletter for Faculty and Administrators

At the Crossroad: Higher Ed and Technology Development

by R. Grant Tate

We are at another major crossroad of technology development, and, once again, education is a late adopter. Networked communications have already expanded our access to vast sources of information and revolutionized person-to-person communications. Internet's World Wide Web has given us a glimpse of how information can be enriched by hypertexted, multimedia presentation. We are beginning to see the enormous possibilities opened to us as learners and teachers. Even at today's level of technology, the revolution is changing jobs as diverse as pizza delivery and rocket science all over the globe.

In this century, we have experienced a number of technologies that promised to revolutionize education. Sages predicted that, in turn, radio, television, teaching machines, and computers would radically change the way that we learn. The primary impact of these technologies would be educational. In a broad sense, they certainly changed the way we learn—by giving us access to more information. But the educational process, as practiced by the vast majority of schools, colleges, and universities all over the world, has changed little. When it comes to pedagogy, the teaching/learning process, education is a late adopter (or non-adopter) of these major technologies. But this technology revolution, accompanied by worldwide restructuring of organizations and jobs, cannot be ignored by education. It is time for higher education to get its act together.

Commercial Markets Drive Development

I recently managed a project sponsored by the European Association of Distance Teaching Universities under contract from the European Commission to study the status of telematics for education and training

continued on page 3

"It's time for our investment strategies to move beyond the laissez-faire, build-it-and-they-will-come approaches that predominate on campus today. What we need are *academic* plans for using technology rather than academics planning to use technology. We must identify and solve significant learning problems. Only then will we realize a return on our information technology investments."

Carol Twigg
Educom
"The One Percent Solution"
Educom Review
November/December 1995

NEWSBRIEFS

MICROSOFT TRAINING PROGRAM

Microsoft Corp. is taking steps to ensure that college students, working professionals, and high school students have access to the training needed to meet the growing demand for experts to design, implement, and support cutting-edge information systems. To help fill the thousands of technology-related jobs currently available, Microsoft has begun the Microsoft Authorized Academic Training Program (AATP). The program is available to any accredited academic institution that wants to offer vocationally oriented technical training, leading to a designation as a Microsoft Certified Professional (MCP) and likely employment at a Microsoft Solution Provider company.

For more information, call Microsoft at 1-800-688-0496 and request the AATP brochure and the Road Map to Education and Certification, an interactive tool offering details about MCP exams and courses.

CAUSE AWARDS

At the 1995 CAUSE conference, held at the beginning of the month in New Orleans, the annual CAUSE special designations were announced and awarded. A record number of attendees participated in the conference as Carole Barone, Associate Vice Chancellor for Information Technology at the University of California/Davis, was awarded the 1995 CAUSE *ELITE* Award for Exemplary Leadership and Information Technology Excellence. Dr. Barone was recognized for her outstanding accomplishments in a career that has spanned two universities (Syracuse and UC/Davis) and several national organizations, including CAUSE, Educom, and the Coalition for Networked Information.

In addition, the Award for Excellence in Campus Networking was presented to Cornell University for a network that includes administrative support systems, library preservation and distribution projects, an instructional Web server, and a real-time desktop video conferencing system (CU-See Me).

For more information, contact CAUSE at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 449-4430; info@cause.colorado.edu.

NACUBO/CAUSE ON FINANCIAL INFORMATION SYSTEMS

A jointly sponsored program by CAUSE and NACUBO designed for both small and large institutions, "Financial Information Systems: Critical Success Factors," will be held February 5–6, 1996 in Houston, Texas. The program will cover topics such as the importance of creating an information architecture and strategy, the importance of institutional buy-in, and developing an RFP.

For more information, contact NACUBO Professional Development, One Dupont Circle, NW, Suite 500, Washington, DC 20036; (202) 861-2500.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1995, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

At the Crossroad: Higher Ed and Technology Development ...

continued from page 1

in the United States, Canada, and Australia. (The term *telematics*, as used in Europe, includes computer and telecommunications technologies and associated software.) One of the observations from the study was that the education community has had little impact on the specifications for the generic technologies that affect education.

Although many of the broadband experiments involve education, designers are primarily concerned with commercial rather than educational requirements. The design point for most broadband networks and digital TV systems is entertainment and commerce. These companies are concentrating on ways to deliver video movies on demand or real-time shopping into our homes. The consumer's primary feedback (or interaction) will be to select movies or products to buy by pushing certain buttons or touching the screen—not to interact with sophisticated education or training presentations. The need for interaction is not well understood by designers or the education community.

Why? Commercial and consumer markets are the primary drivers of technology development—education markets are relatively small compared with consumer markets. Of the more than $80 billion that consumers spend on information-software products (including books, home video, cable TV, video games, etc.), only about $2.5 billion is spent on textbooks and educational materials. Further, education titles make up only about 10 percent of the $1.45 billion in U.S. CD-ROM sales.

Of course, consumers spend most of their education funds on public and private education through taxes and tuition. Little of these funds are spent on educational technology. Only $6 billion of the approximately $150 billion spent on higher education went to technology in 1994. Higher education has spent only about $20 billion on technology in the last 15 years. As author and technology consultant Lewis J. Perelman has noted, education spends 93 percent of its output on labor, or human resources. Higher education continues to spend its capital on buildings and physical plant, not on technology. In the higher education sector, buildings are a sign of growth and prosperity, and—an important attraction for well-to-do benefactors—buildings can be named after people. We have not yet learned to name networks (although the William Gates Interactive Broadband Education Network has a good ring to it).

> ***Higher education continues to spend its capital on buildings and physical plant, not on technology.***

Higher Education's Ambivalence Toward Technology ____

Education is not fully committed to the application of technology as a means of providing better customer (learner) products and services. The relatively small investment in technology reflects a number of attitudinal and structural issues.

Faculty members are ambivalent about, if not outright hostile to, the use of technology in the teaching process. Administrators are more positive about the need for change, but, faced with reluctant faculties and budgets that overwhelmingly go to pay for staff and administrative salaries, they find it difficult to shift their organization's priorities.

The net result is that technology application is managed as a peripheral or experimental issue, not as a mainline strategy for the institution. This is reflected in the organizational structures of colleges and universities, which put technology and pedagogy out of the academic mainstream.

Departments responsible for instructional and technology design are isolated from the mainstream. In most countries, faculty departments are responsible for curriculum and content, but responsibility for educational technology or instructional design is assigned to a separate department. Often the employees of these departments report to a vice chancellor of instructional services or a similar official who reports outside of normal faculty channels. This separation is even found in the formalized distance teaching universities of Europe, whose primary mission is to provide open and flexible learning to learners at a distance.

These educational technology organizations, separated from the faculty by organizational walls, are then given the responsibility for implementing the institution's technology and instructional design experiments. The structure helps breed proprietary systems and places

continued on page 4

R. Grant Tate is president of Bridgewater Research Group, a globally networked firm headquartered in the Netherlands that provides research, consulting, and training. This article first appeared in the Winter 1995 issue of Technos and is reprinted with permission.

At the Crossroad: Higher Ed and Technology Development ...

continued from page 3

educational technologists in a position of having to convince recalcitrant faculties to use them.

But the faculty usually has other priorities. Faculty reluctance is warranted, given the compensation and reward structure of most universities. There is no incentive to develop new pedagogical procedures or to integrate technologies into the process. Faculty members get paid to teach a certain number of student contact hours with "release" time granted to participate in sponsored research. Most of the time, there is no financial or time reward for participation in technology-based education or redesign of a course for good instruction. In addition, papers written about innovations in teaching methods do not boost the careers of professors in fields outside of the education departments. A chemistry department requires its professors to write about research in chemistry, not about the use of networked multimedia as a better method of teaching. And publication of videotapes, CD-ROMs, or other alternate media materials does not carry sufficient academic prestige in the tenure race.

How Faculties Use Technologies

In this environment, faculty members apply technology to make their jobs easier, not to improve learning effectiveness or efficiency. As independent operators, faculty members are highly motivated to conserve their own time. Overhead transparencies make it easier for them to prepare their classes, student papers prepared on computers are easier to grade, and e-mail makes it easier to communicate with students. Faculty members have also been quick to use the Internet and other on-line databases. These, of course, represent major efficiency improvements for the realm from which professors get their major reward: research and research collaboration.

On the other hand, adapting a course to a new delivery medium, integrating technology into the pedagogy, or designing a course to be consistent with good instructional design requires a huge investment of faculty time and effort.

Faculty members are ill-prepared to design courses for new media. Primary and secondary teachers are taught how to teach as a fundamental part of their teacher education program. In higher education, however, subject-matter expertise is the primary emphasis. Seldom are college and university teachers taught how to teach; they learn teaching the way that most of us learn parenting—by watching how they were taught. It is no surprise that chalk and talk is still the primary method of instruction. Many colleges and universities have teaching and instructional design programs for faculty members, but participation is voluntary.

> *A chemistry department requires its professors to write about research in chemistry, not about the use of networked multimedia as a better method of teaching.*

We can never hope to make every faculty member an instructional designer or educational technologist—their primary concentration should be on their subject matter. Team-based course development is an effective approach to this issue with a faculty member (rather, subject-matter expert), an instructional designer, and an educational technologist working together to develop a course.

The Effect of Credentialism

Because they have a monopoly on credits and credentials, universities have pushed poorly designed and executed courses on an uncritical market. Most educational television in higher education today consists of "talking heads"—simply a television transmission of a professor in a classroom, supplemented by some sort of feedback or interaction. Learners endure such poor television quality because, if they want the three credits, they must either watch television or travel to a classroom, search for a parking space, and spend extra time. Without the incentive of the credits, viewers would not tolerate such poor quality television.

Industry has unwittingly reinforced the credentialism of today's system. In their zeal to downsize and reengineer, corporations have been moving responsibility for professional development back to the individual employee. The employees, seeing their eroding job security, have moved into credited university-based courses rather than take company-sponsored non-credit courses—thus trying to guarantee that their education will be recognized by prospective employers.

Without the credit system, higher education would be forced to compete with better offerings of higher quality and better value for the learners.

Education lacks the expertise and critical mass to be a major factor in delivery systems in the new world.

In the past, higher education had absolute control over its delivery mechanisms. Students paid their tuition and attended classes where the instructor could take the roll call. Universities have tried to hold on to their delivery functions by developing proprietary education technology.

The work of specifying and designing education technology systems usually falls to the education technology department. Although the technologists may use commercial components, the system design is usually their own. These institutions diminished their influence with commercial providers by concentrating on proprietary systems. They would have had more clout, had they concentrated on needs and not on sandbox solutions, for few universities are in the position to design and implement modern sophisticated network solutions for large numbers of users. Education should concentrate on being a user—not a provider—of telematic delivery systems. In other words, education should provide content, not networks.

The Time for Change

To become major players in the use of technology, higher education needs to make a commitment to change, shift its priorities, become more marketing and customer oriented, unlock the "fixed expenses" of faculty and staff salaries, change the incentive system for faculty members, and change the attitude of large numbers of faculty and staff. This is a tall order for a sector that is so locked into tradition. The change will not likely come as a result of internal resolve but from overwhelming external forces.

The stage is set for this new play. Here is one scenario: New production, delivery, and certification organizations (PDCs) will invade distribution of higher education courses. These PDCs will operate on a national basis, using the most efficient and effective communications media available. Courses and programs will be designed and produced to commercial standards. Professional hosts and teachers will be chosen from among the best and will tend to emulate commercial on-air talent. Local tutors will supplement the process and be available to students for a fee.

These organizations will purchase subject-matter expertise from many sources, depending upon the degree of expertise and the quality of content preparation. The PDCs will provide competence-based testing and certification services. Students may participate in interactive testing at the time and place of their choosing—and pay a fee to receive certification upon successful completion of the procedure. At first, credits awarded by the PDCs will "flow through" from the institution that provides the content. Later, independent accreditation agencies will assess the process, content, and certification of the PDCs.

Few universities are in the position to design and implement modern sophisticated network solutions for large numbers of users.

The PDCs will then move to provide their own portable credits. Colleges will begin to concentrate more on liberal arts and the socialization of recent high school graduates while emphasizing basic learning skills and the development of critical thinking. Specialized curricula will be purchased from PDCs. Universities will concentrate on research and the development of new knowledge with a primary objective of working with PDCs to distribute that knowledge to the outside world. An additional goal will be to train new subject-matter experts and researchers. A university's revenues will partially depend upon its ability to sell its subject matter to the PDCs.

Business and industry will look to the PDCs for on-the-job subject-matter training, delivered to the employee's desk. Certified credits awarded by the PDC will be "portable" and recognized by all other businesses or PDCs.

To some, this may seem an unlikely, radical model. Yet, some elements of it exist today in places such as the National Technological University.

Higher education's strategy should be, "If you can't beat them, join them." They should join with PDCs, telecommunications providers, companies, governmental agencies, and other universities to use the new telematic technologies. Most states are developing their own information highway initiatives that include education as a major component. Most include telecommunications and other commercial providers. By participating in such efforts, education can increase its influence on the information highway's future direction. Such activities, in turn, may shock reluctant university constituencies sufficiently to force necessary internal organizational and procedural changes. ■

Using IT to Create a Student-Friendly Campus

The name of the game at most colleges and universities today is *enrollment management*: attracting and retaining the right number and the right mix of students to maintain the institution's viability. And to support enrollment management goals, more and more institutions are recognizing the need to create student-friendly environments.

How does a student-friendly environment differ from the traditional college campus? It basically centers around the realization that student life outside the classroom and the non-academic activities that students engage in can and do have a significant effect on the quality of a student's collegiate experience. Academics is vitally important, of course, but the more positive a student's non-academic life is, the more likely he or she is to stay in school. This means two things: removing, as much as possible, the negative experiences and enhancing, as much as possible, the positive ones.

This is where information technology comes in. IT can be one of the most important tools that an institution can employ in creating a student-friendly environment. IT can make administrative tasks easier and more efficient, it can make access to campus information more timely and useful, and it can be both fun and enriching for the student, even while pursuing non-academic activities.

On the administrative side, providing the highest level of student service has become so important for so many campuses, that it alone can be the rationale for acquiring a new administrative system. Such things as touch-tone or on-line registration have become commonplace; it is the rare school nowadays that requires students to go through the time and uncertainty of arena registrations. But IT can go way beyond that. The ability to deal with exceptions is one of the treasured characteristics of IT, and so it can become a most valuable tool in helping the institution treat students as individuals. For instance, sending a bill representing half of a student's tuition charges to each of two parents at two separate addresses; accommodating a wide variety of deferred payment plans and third-party payers (not to mention accepting credit cards); mailing to adult students using their own names instead of "To the parents of..."; providing opportunities to pre-register for next semester's classes and to sign up for housing while on Study Abroad; being able to handle a student's administrative difficulty, whether with financial aid, tuition, records, registration, or housing, all in one location; supporting orientation sessions geared specifically toward different groupings of incoming students; creating individual approaches to student support areas, such as career services and counseling; and on and on. These are just some of the many ways in which technology can help make the administrative environment for students friendlier and easier to deal with.

> *Contrary to conventional wisdom, the true nature of IT allows for each student to be treated according to his or her own needs and wishes.*

Ironically, IT has a reputation in certain quarters for contributing to students "being treated like numbers instead of people." In fact, often one of the major resistance points in implementing new administrative information systems is that student services folks feel that the school will lose its "human touch." Yet when properly employed, the true nature of IT allows for each student to be treated according to his or her own needs and wishes.

While it may be true that these kinds of things are not so important in smaller schools that cater to a fairly homogeneous student body, by far the majority of institutions do need to be able to accommodate a wider and wider variety of students, each with his or her own characteristics, desires, and needs. A solid information system helps an institution do that, and minimizes the run around that students have to go through to get things done.

In terms of access, IT again has an important role to play. IT can enable a student to see his or her own administrative records, whether through a public kiosk or directly through the student's computer. IT can also provide access to campus information: which classes are closed during registration, who's coming to campus next Friday to give a concert; what the office hours are for the student's advisor; which days the health services are giving flu shots; and when classes are closed because of snow.

Perhaps most importantly, IT can provide students access to each other and to the faculty. The use of e-mail is probably one of the fastest

growing IT areas on campus. Students can communicate with their instructors, with their advisors, with their research directors, and with the librarians. They can collaborate on projects with other students, they can arrange student activity meetings, and they can have on-line chat sessions. And not only can students communicate on campus, but in those institutions hooked up to the Internet, the students can stay in touch with their friends at other schools—and even with their parents if the parents have access of some kind either at work or at home.

Of course, using IT can go way beyond just access to campus information and communications. It can provide the conduit to a whole world of information and tools for fun, entertainment, and education. Access to the Internet, especially the World Wide Web; access to the computers and to the resources at other educational institutions, research facilities, and libraries; and the ability to communicate with literally the whole world is something that increasing numbers of students are coming to expect as part of their educational environments.

Another area is in distance learning support. A great deal of attention is being focused on distance learning itself these days, but we also need to recognize that student support services at a distance are equally important. The ability to be advised, to register for classes, to pay tuition bills, to receive tutoring and other support services in remote locations is greatly enhanced through the use of technology.

The debate may be raging on the academic side about whether technology makes a difference in student learning. There is a great deal of research being done on this at the moment, and it's fair to say that the jury is still out. But outside the classroom, looking at the rest of a student's campus experience, the picture is clear: IT can make for a very student-friendly environment, and can, therefore, contribute significantly to one of the most important goals at many institutions today: a stable and reliable recruitment and retention picture. ■

"Higher education in the 1990s is more technocratic and entrepreneurial than ever before. Computing-across-the-curriculum, a 1980s vision now achieved on most campuses, has hardly infused scholarship or pedagogy with a stronger impulse to reflect critically on the cultural mission of higher education. If anything, campuses now function more like industrial parks than ivory towers; even faculty in the arts and humanities must think like entrepreneurs in an era of scarce resources.... The solution? Do 'more' with less by replacing instructors with machines and programs in distance learning 'departments' of virtual, on-line universities. Teacher resistance scuttled the instructional television movement in the Sixties. Will faculty in the Nineties have the foresight to resist budget-driven administrative strategies to network them out of their jobs?"

Mark Shields
University of Virginia
"Academe Enters the Age of Anticippointment"
Technos
Fall 1995

In Future Issues

- *Tying IT into the goals of the institution*
- *Case study on an IT Policy Committee gone wrong*
- *Why governance is more important than hardware*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We've just recently combined our administrative and academic computing departments and are now faced with how best to organize the new information technology services department. We don't want to maintain the old divisions, but we also want to remain sensitive to the needs of our end users by designating some specialists. Any ideas how to do this?

A. *There are as many ways to organize a higher education IT department as there are colleges and universities. However, there do seem to be some predominant patterns. One we favor is a back room/front room approach: the highly technical, non-user-oriented folks are on the "Technical Services" side of the house, including programming and support for operating systems, database management, networking support, hardware operations, microcomputer hardware setup and troubleshooting, telephones (if that's part of the department), and research and development. There is not usually any specialization in this area with respect to clientele; everyone needs these services. The other side of the department is "User Services," the folks who work directly with end users for applications programming support, public labs, help desks, desktop software support, training, and so on. Specialties can be maintained in this area for both administrators and faculty, as appropriate, but a great deal of what goes on here too will be for everyone. The two groups work together to provide solutions to end users; Technical Services supports and interacts mostly with User Services, who, in turn, interacts mostly with the users. The other advantage to this kind of organization is that it can be constructed to be fairly flat, and therefore, quite flexible.*

Q. We're installing a new administrative system and have decided to take a "plain vanilla" approach so we can get it in as quickly as possible. Many folks are complaining, though, because it's not giving them enough time to think about how they want to change their office procedures. Should we slow it down?

A. *The desire to reengineer during implementation is a worthy one, but the problem is that stretching the process out too long has its own risks, including the possible loss of key people. Most institutions reach a compromise, with a commitment for a Phase II after the initial implementation.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

THE EDUTECH REPORT

January 1996

Volume 11
Number 10

The Education Technology Newsletter for Faculty and Administrators

Structural Principles For IT Organizations

Many higher education IT groups are going through the agony of reorganization right now. Whether brought about as the result of combining administrative and academic computing, because of the establishment of a new Chief Information Officer (CIO) position, impending retirements in key positions, or just a general re-thinking of what IT means for an institution these days, there seems to be an enormous amount of restructuring (not to mention downsizing) going on in campus IT organizations.

Although usually very stressful, especially for the people involved, reorganizing can be a healthy thing to do. It is likely to be most productive and worthwhile, however, if every person in the role of decision-maker or contributor (with luck, that's a lot of people), keeps in mind five basic structural principles.

Principle #1: The organization structure should be based on the needs of the users and the institution. The functions, services, and products provided by the IT department should be organized in such a way that the users can get what they need efficiently, with the least amount of frustration and run-around and the maximum amount of satisfaction (for the service providers as well as the users).

This principle may seem so obvious that it doesn't need to be mentioned, but it is not always used to the extent it should be. For one thing, there may not be agreement on what the needs are. Do the users need an advanced technology guru (or more than one) in the department? Do the users need COBOL programmers? Batch report decollators, bursters, and distributors? A Unix support person? Instructional design experts? What about infrastructure things that are largely trans-

continued on page 4

"It is easy for information resources professionals to be captivated by the allure of the brilliant advances and the frenetic pace of technology. The fun and excitement of our business can easily cloud the core essence of who we should be. We need to sustain both values and moral courage. We must remember that a major purpose of higher education is for students to compose a sense of meaning to their lives. Let's challenge ourselves to build into our systems and our personal and professional behavior the mentoring capability that supports the making of meaning by the students of this new era."

Ronald Bleed and Polley Ann McClure
"What Information Resources Managers Need to Understand About the Higher Education Enterprise"
CAUSE/EFFECT
Winter 1995

NEWSBRIEFS

CONFERENCE ON IT IN THE CURRICULUM

Syllabus '96, to be held July 20–24 at Sonoma State University in California, will cover a range of higher education IT topics, such as technology and pedagogy, classroom technologies, Web-based learning environments, and infrastructure and implementation. The conference will also feature case studies, tutorials, pre-conference workshops, and vendor exhibits.

For more information and a conference brochure, contact Syllabus Press, 1307 South Mary Avenue, Suite 211, Sunnyvale, California 94087; (800) 773-0670; syll96@syllabus.com.

PROJECT MANDARIN

According to the organizers of Project Mandarin, the project is "about using computers, networks, and point-and-click interfaces to get information from databases to the hands of students, faculty, and staff who need it. Its mission is to help solve common, information-based problems experienced by universities everywhere."

Organized as a consortium of more than twenty-five colleges and universities, Project Mandarin has produced a tool kit and a full suite of infrastructure services that permit the quick development of applications and underlying services. These applications and services are for the purpose of permitting secure access by non-technical campus users to data kept in a wide variety of database management systems, including Oracle and Sybase, as well as older data structures such as VSAM. Products from Project Mandarin can also support a gradual migration to client/server technology without sacrificing current systems.

For more information, including background documents and a list of current members, contact Project Mandarin, Inc., 400 CCC, Garden Avenue, Ithaca, New York 14853; (607) 254-2947; mandarin-mailbox@cornell.edu.

NOT NECESSARILY THE NEWS

In an article entitled "Good Help Gets Harder To Find" in a recent (11/13/95) *Computerworld,* author Brian McWilliams tells us that the demand for IT professionals is running well ahead of the supply. Especially in the case of those with certain skills, the lack is showing up in many IT departments; chronic understaffing, or being forced to hire lower levels of expertise than needed or desired, is becoming the norm. One person quoted in the article said, "You try to build a culture that people want to be part of, but it's hard when someone else is offering them a 30% jump in salary."

This, of course, came as a great surprise to those in the higher education community, who have been finding it extremely easy to attract and retain top-level IT professionals willing to work for lower pay for years.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1996, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

M e m o r a n d u m

TO: My Colleagues at Other Institutions

FROM: Jim Stevens, CIO at The University of the Deep Southwest

SUBJ: The Information Technology Policy Committee

Friends, I need your help. Two years ago, on the advice of a consultant, we set up an Information Technology Policy Committee for the purpose of advising us on broad-scope IT matters at the institution. Before we did this, there was a considerable amount of dissatisfaction with the quantity and quality of IT services, due mostly to the fact that my department, Computer Services, was severely underfunded and understaffed. Setting up this committee made a lot of sense to me at the time because I saw it as a way to get more resources, and therefore, it would give me the ability to correct our problems.

Unfortunately, it hasn't turned out that way at all. For one thing, although the committee is made up of all of our Vice Presidents and the Chief Librarian, most of these folks never show up for meetings. Many of them do send representatives, but sometimes, no one from a particular area is there at the meeting at all. I chair the committee, of course, and set all of its agendas, and I just can't understand why the VPs don't want to be there.

The other major problem is that the topics I want to talk about are not the topics they want to talk about. Even with agendas sent around beforehand, once the meeting begins, we get off onto all sorts of tangents (like why a microcomputer is still sitting in its packing box on the floor of the VP for Resources' secretary's office after three months). I want to talk about mission, values, and resources, and they want to talk about trivia! As a result, I haven't had any increase in funding or staffing, so there are still complaints about my department from all over campus.

I know many of you have this kind of a committee in place. Are any of them working well? Do they serve any really valuable purpose? I'm at the point of just disbanding mine, unless I hear from you that I can turn it around somehow and get it to do what needs to be done. I appreciate any help you can offer.

Structural Principles for IT Organizations ...

continued from page 1

parent to the users? Many of these services are ambiguous or controversial, and the users may well have one point of view and people in the department another. A classic example is the department that will not or cannot provide Windows support on a campus in which—although perhaps a minority—there is a substantial number of Windows users. The department has mandated that this will be a Mac campus, and regardless of what may be best for many users, is trying like heck to stick to this position.

Another reason to explicitly consider this principle is that there could well be functions and services being provided in the department now that are holdovers from yesteryear. Certainly few departments today need to provide, for instance, keypunch services (although it's not zero yet), yet there are some that still have a box for this function hanging off their organization chart somewhere.

Before a new organizational structure for IT can be designed, a full, realistic inventory of user needs should be compiled, taking into account infrastructure, products, and services. This will point the way to a rational and responsive structure.

Principle #2: Change is constant. Now that you have an inventory of user needs, keep in mind that it will change in the next few minutes. That may be an exaggeration, but not really by much. Let's just look around us and consider what has changed in say, the last five years: the wild growth of microcomputers among people who are not "technologists" (in 1995, PCs outsold TV sets in the US for the first time), groupware, relational databases with graphical user interfaces, electronic mail, the World Wide Web, just to name some of the more obvious ones. Now let's consider what is likely to change in the next five years: anytime-anywhere-computing, anytime-anywhere-100% reliability-telecommunications of anything that can be digitized; new database structures, object-oriented programming, fuzzy logic, expert systems, new kinds of code generators, and on and on.

We can't predict what's going to happen (the oft-cited example of our failure to predict well is the famous 1943 quote by Thomas Watson, chairman of IBM: "I think there is a world market for maybe five computers."). We don't know what our users are going to need from us a year from now; we barely know what they're going to need from us tomorrow.

> *In the current era of flat organizations, team-building, and distributed decision-making, the pyramidal hierarchy seems out-of-date as a structural option.*

What does this imply for organizational structures? Most of all that we have to be flexible. Furthermore, that flexibility needs to extend to each of us as information technology professionals, as well as to our organizations. Willingness to learn new things, adaptability to new situations, lots of ambiguity, and so on, are all parts of an IT professional's life these days. So, too, our organizations have to be nimble, responsive, able to meet changing demands quickly, and not locked in by artificial definitions. One of the most important values that the organizational structure needs to promote, and that we need to subscribe to as individuals, is open communications. The only way we're going to get through this is by keeping each other well-informed and up-to-date on everything.

Principle #3: Hierarchies have their advantages and disadvantages. The traditional pyramidal hierarchy has gotten a lot of bad press these past few years. In the current era of flat organizations, team-building, and distributed decision-making, the hierarchy seems out-of-date as a structural option. But before we disband the notion entirely, it could be useful to consider what's good in a hierarchical structure; it has, after all, been the option of choice until recently for a very long time. And for some good reasons.

For one thing, the lines of authority and responsibility are very clear. Which box on the organization chart is responsible for which set of tasks (and which people) is very apparent from first glance. Who the boss is is never in doubt (as it can be with cross-functional teams, for instance).

Likewise, the pyramidal hierarchy tends to lead to an efficient division of labor; lopsided conditions show up immediately. There are also very clear career paths—the higher up in the chart you go, the better the job is: more people to manage, more responsibility, higher pay. All laid out in neat little boxes, layers, and lines. The value of that sort of clarity should not be discounted, especially in times of constant change (see Principle #2);

it can provide people with a lot of security and comfort.

But the disadvantages must be considered as well. Especially in IT organizations, all those neat little boxes and lines can lead to a rigidity which works very much against the tides of change. The hierarchy can also lead to lots of turf battles, and when working together is important (when isn't it?), these battles can literally destroy an IT organization. Just think of all the things that can (and do) fall into the "white spaces" on the chart.

On the all-important matter of fluid communications, the hierarchy doesn't do very well at all. The very clarity that makes the organizational chart appealing works against openness and rapid information flow, especially as levels proliferate and the distance between the highest and the lowest levels increases. (The chain of command prohibits, for instance, "going over the boss' head" with anything important). This can be deadly for an organization that has to react quickly to changing circumstances.

What we want to end up with, therefore, is an organization that, as much as possible, incorporates the virtues of the pyramidal hierarchy of clarity and efficiency while minimizing the disadvantages of rigidity and lack of free-flowing communication.

Principle #4: We don't necessarily have to do everything ourselves. Time was, of course, when the Not Invented Here (NIH) syndrome ruled the IT world. If we didn't do it ourselves, it just didn't get done. From applications programming to hardware operations, from Help Desk support to microcomputer maintenance, there has been an on-going reluctance for the IT department to let go of any of its tasks. If you listen well, you can still hear it: "There is no commercial software out there that fits our needs well enough" or "No one knows our users as well as we do."

That's changing. Commercial software is getting better, vendors are becoming increasingly knowledgeable and understanding about what a higher education environment is all about, and certain IT tasks have become sufficiently transportable and transparent to be able to supply them externally. It turns out that selective, judicious outsourcing can be a good thing, both economically and from a service standpoint.

Especially in IT organizations, all those neat little boxes and lines can lead to a rigidity which works very much against the tides of change.

Another aspect of this is distributing tasks out of the IT department but within the institution. For instance, it has become quite acceptable—desirable, even—for end users to write their own reports using data kept in the institutional database. Retail computer sales could best be handled through the campus bookstore. Network wiring, and even microcomputer setups, might best be done by Physical Plant.

In these times of increasing workload and demands, without a corresponding increase in staff (very rare now), an IT department needs to consider all of the opportunities to offload itself so that the department's people can leverage the limited time they have to provide maximum benefit to the users. It only makes sense to consider ways to reserve IT staff time for the most important, tailored, and value-added work.

Principle #5: Some things we can control; some things we cannot. Of course, we want to live in an ideal world, or at least, work at an ideal college or university. Deep down inside, we know there is no such thing, but many IT professionals think that if they could only get their ideas across in the right way to the right people, the institution would be, if not perfect, at least a lot further down the road. Unfortunately, however, a lot of important things in the institutional environment are simply beyond the control of the IT department.

Yes, we want the users to be our partners, but we also have to remember that as hard as rapid change is on us, it's even harder on them. They may not participate on committees the way we want them to; they may not do enough planning in their own areas to make it easier to our job in servicing them; they may not understand what IT is all about. There is little we can do to control that.

But we can be understanding and patient. We can be role models of adaptability. And we can structure our IT organizations so that we have every opportunity to show leadership and influence. ■

In an upcoming issue: How to get from here to there—fitting existing people into a new organization structure.

Why Distance Education?

by Steven W. Gilbert, AAHE

Distance learning is ubiquitous. As you read this article or watch the Discovery Channel, you are learning things prepared at a distance. If we change the locution to "distance education," by implication an educational institution enters the picture, but we are still dealing with something that's been going on a long time, all over the world. Correspondence courses, for example, were an innovation of the 1920s; courses by television became commonplace in the 1960s.

In the past two years, American higher education's interest in distance education has exploded. Suddenly, the technology seems to be there; the economics look attractive; we're supposed to serve more students, especially adults, and find new markets and revenue streams... many roads, it seems, lead to distance education.

The new interest in distance education arouses both unrealistic hopes and unfounded fears. On the hopes side, the claim is that instruction mediated by telecommunications will bring new gains in productivity, that somehow we'll hike access and quality while reducing costs—a claim for which there yet is precious little evidence. Or we hear that technology is the route to new populations of learners in whose wallets there sits a financial bonanza—another unfulfilled hope.

On the fears side, there are reasonable concerns about quality and the personal side of education, and unrealistic ones about the imminent replacement of faculty by machines.

Most broadly, distance education is any form of teaching and learning in which teacher and learner are not in the same place at the same time, with information technology their likely connector. Of course, faculty members have known for a long time that students don't have to be together all the time with a teacher to learn effectively; students can and do learn independently, in groups, from reading and projects, and so on.

Once the hegemony of an in-person, here-or-nowhere-else view of learning is broken, new possibilities open up. Today, for example, we've begun to grasp the educative power of groups; but we've just scratched the surface in understanding the options for faculty in forming and interacting with groups or in knowing how the work of a group is affected by the media it uses for interaction.

Distance education, then, requires thoughtful attention to pedagogy and to the settings in which learning can occur. The sheer power and rapid improvement of telecommunications options make it imperative that we identify how to use best combinations of face-to-face, independent, and "distant" learning. As we do so, we'll find insights that help us rethink what we do in "non-distant" education—with or without technology.

The following is only a beginning list of questions for discussion.

Fundamental research and policy issues. For which purposes and under what circumstances is it important to have learners and teachers together in the same place at the same time? What special resources or beneficial conditions are available only to those who can participate in person on campus? Only to those who participate elsewhere? For which purposes and under what circumstances is it just as good—perhaps even better—to have people interacting via telecommunications? Working independently? What is the right balance among face-to-face, telecommunications, and individual work? What kinds of face-to-face interactions can or should be replaced by telecommunications options?

Student participation and benefits. What portion of students at your institution are already participating in which forms of distance education? With which benefits, for whom? How many students who currently cannot access your offerings would be enabled to do so via some form of distance education? How would such students gain access to the necessary technology? (For example, if e-mail is the vehicle, how would students who cannot get to campus get access to e-mail?) To what extent are "regular" students requesting access to "distance education" materials to enhance their own learning (e.g., students with learning disabilities requesting the use of videotapes as a supplement to live lectures)?

Faculty participation and benefits. How many faculty at your institution are already participating in which forms of distance education? What are the benefits to them? What kinds of incentives can be offered to faculty for teaching via distance education? How will faculty get compensation and/or release time for such teaching? If a faculty member is audio- or video-

Steven W. Gilbert is the director of technology projects at the American Association for Higher Education (AAHE). *This piece appeared originally as a foreword to the December 1995 AAHE Bulletin, a special issue focusing on distance education.*

taped as part of teaching a distance education course, who owns what intellectual property rights to that tape? Who decides when and under what conditions that recording is used? Who gets what fees? What about "derivative works" based on that recording? What if the faculty member subsequently leaves the institution, or later changes his/her mind about something that he/she said? Who, in effect, owns the course "syllabus"?

Infrastructure to support distance education. What special facilities and equipment (at both the teaching and the learning ends) are needed for given versions of distance education? What special training and support services are needed and available to faculty and students engaged in distance education? How are related instructional materials—books, articles, laboratory specimens—delivered to distant students in a timely fashion? If demand for use of scarce distance education resources (e.g., specially equipped classrooms) increases faster than their availability, how will the resulting conflicts about priority be resolved?

Institutional costs and benefits. Can your institution use distance education to reach more students and provide the same or better quality learning? Can or should it do so with fewer faculty? With changes in faculty responsibilities and the roles of TAs and adjuncts? With new pay scales? Can your institution identify another like itself that has already been able to offer coursework of acceptable quality (by that institution's standards) via distance education that reduces institutional costs and/or increases institutional revenues? What methods can usefully assess the quality and impact of the forms of distance education you are using or considering?

Long-term impacts. If an institution "succeeds" at replacing faculty with distance education technology, what will the ultimate result be? If you don't need the faculty, do you need the college? Could the "edutainment" industry do a better job than your institution in mounting a particular offering? Will most education eventually include the use of telecommunications as a facet, the way most education now includes the use of books? ■

For additional information, and the opportunity to "discuss" distance learning and related topics of teaching, learning, and technology, you are invited to subscribe to AAHE's highly moderated Internet discussion listserv AAHESGIT. To subscribe, send the e-mail message to listproc@list.cren.net. (with its subject line left blank): subscribe aahesgit yourfirstname yourlastname.

"As human beings we have been conditioned to believe that external forces control our being, and in order to make changes in our lives, we must change our outside circumstances. As many of us know too well, there will always be people or forces that can disrupt our work, threaten our jobs and our role in the industry, or make what we say one day irrelevant the next, no matter how much power we may think we have accumulated. Additionally, there are usually limits to how much we can do to change things or resist certain changes within our institutions, even if we have a lot of power and influence."

Margaret G. Massey and Deborah W. Stedman
Miami-Dade Community College
"Emotional Climate in the Information Technology Organization: Crisis or Crossroads?"
CAUSE/EFFECT
Winter 1995

In Future Issues

- *Tying IT into the goals of the institution*
- *More on organizational issues: when and why to reorganize*
- *Why governance is more important than hardware*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. We have always considered ourselves—the computer services department—very "customer-friendly." We try as hard as possible to accommodate everything the users want or need from us while maintaining an open, cheerful attitude. Lately, though, with rising demand levels, this service attitude is wearing very thin and creating a lot of stress. The users' demands seem to be endless and increasingly difficult to satisfy. We're quickly getting beyond the point where any of us feel like being cheerful—we just want to snarl when any user approaches. Any suggestions?

A. *Yes. Start by working out some new definitions of "customer service" that take into account the fact that your human resources are limited. This is such a common problem because IT folks do tend to be so service-oriented and somehow, many of them have gotten the idea that this means always having to say "yes" to every user that walks in the door. The reason the demands seem to be endless is because they are endless, and it is completely unrealistic to expect to satisfy them all. One definition of customer service you might try out is this: "Meeting or exceeding the realistic expectations of an educated user." That definition implies that IT has helped to both educate the user about costs and value and has contributed to the setting of realistic expectations. For those who think that definition may be too stringent, consider this: To keep on the way you are will inevitably lead to a collective nervous breakdown, and then where will the users be?*

Q. We want to institute a student technology fee, but state regulations require that we put this to a student vote first. Is there a way to "sell" this idea to the students?

A. *Absolutely. For one thing, initial proceeds should be used to upgrade the equipment in student labs (we're assuming you need to do this; if not, you are unique), so that the students can see direct benefit very quickly. Promising modern and powerful computers in sufficient quantity to handle the load can be a major selling point. Other, more philosophical, discussions can also be held that compare having quality computing on campus with having a quality library. The students will support this idea.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

RIE

THE

February 1996

Volume 11
Number 11

EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Dear Webby — Advice for the Web Worn

by Howard Strauss, Princeton University

Dear **Webby**: I've read that some universities are making their legacy systems available via the web. In fact, I've been told that we could even take our regular green-bar paper reports and display them with a web browser such as Netscape or Mosaic. I thought that web documents had to use HTML (HyperText Markup Language) for formatting, yet I know that our legacy systems were all written before HTML was even invented. Can our users really find happiness on the web without HTML? Can we really change our stodgy old legacy systems into slick web apps without forcing our programmers through the culture shock of learning HTML and URLology? Can I trust someone who says I don't need HTML? Dreamily, R. V. Winkle.

Dear R. V.: Web browsers are quite capable of displaying text without HTML, no matter how ugly the text is. So you do not have to add HTML to your text, unless you want to please your users.

It is not enough to do something better for your users. If they previously could not get reports on-line at all, you might think that giving them 132-column green-bar on the web would be a big step forward; and it would. But that is not good enough. In fact, if you plan to stay in business, that should not even be acceptable. As a web publisher (which is what you are when you put things on the web) you are not competing with the green-bar reports that are a legacy of 1960s technology, you are competing with Levi's home page (at www.levi.com), SGI's home page (at www.sgi.com), and the thousands of other slick home pages that your users see every day. The web can do things that green-bar cannot do and you are obligated to take advantage of the features of the web that have made it the runaway success that it is.

continued on page 3

"IT will change teaching and learning profoundly, no matter what the response of traditional higher educations institutions. Just as the development of the printing press forever changed the teaching enterprise, IT represents a fundamental change in the basic technology of teaching and learning. The transformation will take a long time, long enough for critics to claim that perhaps higher education can thrive without fundamentally changing itself in response to the new technology. If traditional colleges and universities do not exploit the new technologies, other nontraditional providers of education will be quick to do so."

W. Massey and R. Zemsky
Using Information Technology to Enhance Academic Productivity
Educom
1995

NEWSBRIEFS

TECHNOLOGY USE JUMPS ON COLLEGE CAMPUSES

According to *The 1995 National Survey of Desktop Computing in Higher Education*, the use of information technology in college courses—including electronic mail, multimedia, CD-ROM, commercial courseware, and simulations—grew dramatically this past year, as did the number of students and faculty routinely using the Internet and World Wide Web. "Something very significant is happening," says Kenneth C. Green, director of the national survey and a visiting scholar at the Claremont Graduate School. "Following several decades of great aspirations and more than a dozen years of significant institutional investments, information technology has emerged as a permanent, respected, and increasingly essential component of the college experience." Data from the sixth annual survey, says Green, indicate that the use of information technology across all types of institutions is finally moving past the early adopters and breaking into the ranks of mainstream faculty.

Copies of the report are available for $25 (pre-paid) by ordering from: Campus Computing, P.O. Box 261242, Encino, California 91426; (818) 990-2212; cgreen@earthlink.net.

CAUSE'S DCE PAGE ON THE WEB

At their meeting in December of 1994, the CAUSE Board of Directors passed a motion to strongly encourage CAUSE member institutions to investigate adopting the Open Software Foundation's DCE technology as an institutional standard, to promote interoperability across heterogenous systems within and between institutions, to aid in the transition to client/server computing, and to facilitate sharing and leveraging campus technology investments. To support this endeavor, CAUSE has created a DCE page on its web server, which links to selected DCE-related resources on the web that CAUSE thinks will be valuable to campus information resources managers. CAUSE plans to create a section on this page to identify DCE-related products and services in the marketplace, from which a user can link directly to corporate web pages describing those resources.

The address of this page is http://cause-www.colorado.edu/issues/dce.html. For more information, contact CAUSE at 4840 Pearl East Circle, Suite 302E, Boulder, Colorado 80301; (303) 449-4430; info@cause.colorado.edu.

1996 LEAGUE IT CONFERENCE

The 1996 Conference on Information Technology, sponsored by the League for Innovation in the Community College, will be held November 13–16 in Phoenix. Themes include Access and the "At Risk" Student, Managing Technology and Change, Model Programs and Partnerships, and Applying Technology to Teaching and Learning. Proposals are now being sought.

For more information, contact the League for Innovation Conference on Information Technology, 26522 La Alameda, Suite 370, Mission Viejo, California 92691; (714) 367-2884; http://www.league.org.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, Connecticut, 06002-1634; (203) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1996, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

Dear Webby — Advice for the Web Worn ...

continued from page 1

One person, enamored by our ability to put green-bar reports on the web, suggested that we create a web background that actually looked like green-bar paper. I suppose we should also add the sprocket holes and perforations, and display smudged carbons as well. We certainly could. But the web is a technological paradigm shift. At first, TV newscasts were just a radio broadcaster standing in front of a TV camera reading the news. Later, we learned that TV was really different from radio, and learned what it could really do. The web is hypertext, interactivity, and multimedia. We have to at least consider using those features —and not to do the best simulation of archaic technology.

While it might seem like bad news to have to add HTML to everything you put on the web, the good news is that with just a little HTML, things look a great deal better. And with a little more HTML, and some planning and standardization, you can have pages that your users will think are great, rather than ones they will just put up with.

Your programmers will not experience any culture shock over HTML. Adding HTML to legacy output is just a matter of inserting a few constants in the right places. Some of your programmers will learn how to do that on their own. For those that can't or won't, your local HTML guru will be able to provide them the HTML tags and their location. Don't forget that no one really liked green-bar. In the past there just was not an alternative. Now there is and your users know it. They are counting on you to do the right thing. Don't let them down.

Howard Strauss is Manager of Advanced Applications at Princeton University.

Dear Webby: I've heard that HotJava will revolutionize information technology, solve the problems of distance learning, replace all operating systems with free web browsers, and make it possible for faculty, staff, and overburdened IT professionals, such as me, to deliver dazzling web applications in next to no time for practically no cost. I can't wait to embrace the HotJava revolution. How can I get together with HotJava? Warmly, Kwon Valdez.

Dear Kwon: Java has certainly caused quite a stir. However, even if Java turns out to be right for you, HotJava is not the Java you want.

One person, enamored by our ability to put green-bar reports on the web, suggested that we create a web background that actually looked like green-bar paper.

Today Java comes in three varieties; Java, HotJava, and JavaScript. With things changing so rapidly, more Java flavors could appear at any moment. In fact, many programs such as Internet Suite, Latte, and others claim to be the Java of your dreams. It's not clear today which of these will win your heart, but Java and JavaScript have an early lead.

Java is just another programming language. It was developed by Sun Microsystems and is closest to C++, a language used effectively only by the most technically proficient programmers. Even among them, few, if any, know and use the entire language and take full advantage of its rich but confusing syntax and structure. While Java is simpler than C++, it still is so technically demanding that only a very few, very skilled people will be writing programs with Java.

Making matters even worse is that Java is in its infancy. Many of the Java tools, libraries, and support utilities are either currently in very crude form or non-existent. While many companies (including Sun) are rushing to improve the features and development environment of Java, even under the best circumstances, Java programming will remain the domain of programmers, not the users who have managed to learn enough HTML to throw together a basic home page.

Java does have some features that make it particularly suitable for use in creating programs that can be used with the web and other Internet applications. Normally, it is very dangerous to obtain programs via the Internet because of the possibility of obtaining a virulent computer virus along with the free software that you willingly download onto your computer. Java programs written for the web (called applets) are safe to obtain over the Internet. They cannot contain viruses and cannot do bad things to your computer. However, by limiting the bad things that applets can do, some of the good things that an applet might do are also eliminated. Applets still remain quite versatile, but don't expect them to solve all of your web problems, especially those that involve the use of files and databases.

continued on page 4

Dear Webby — Advice for the Web Worn ...

continued from page 3

Another nice thing about Java applets is that they can be written once and will run on most computers. Of course each of these types of computers needs a specially designed Java interpreter, but those should soon be available for most computers and operating systems. A single version of a Java applet will run on a Mac and look like a Mac application should. The same unmodified applet running on Windows 95 will look like a Windows 95 application. This feature has the potential to speed up application development and to make applications universally available over the Internet. But only if your application is something that a Java applet can do. And only if you have or can hire someone skilled enough to write Java applets.

While most web documents today are static (you can fill in a form, but you don't really interact with it), Java applets let you put animations and true interactive applications on a web page. You can actually poke your mouse at something on a web page and have it respond on the spot. You can drag an image around on the screen so that you can see the back of it. You can turn off the valves on a diagram of a nuclear reactor and watch the reactor vessel turn red and—if you don't take corrective action—see and hear it explode.

Java applets are also attractive because they are small (so they move across the network quickly) and they integrate well with web browsers and with the HTML with which web documents are written. While typical web users will not be coding their own Java applets, anyone who can handle the basics of HTML can use the Java applets written by the techno-mavens of the world. To web authors, a library of applets would be a collection of tools for going beyond what one might normally expect the web to do; currently, there is no library of general-purpose Java applets.

There are good alternatives to Java applets for many things. A "plug-in" (a program that works closely with Netscape browsers) such as ShockWave can do flashy animation, sound, and user interaction without the challenging technical demands that Java makes of its authors. Before getting too involved with Java, you might want to consider one of the plug-ins.

HotJava is a web browser written by Sun that can process Java applets. When HotJava was written there was no other way to use Java applets. The Netscape and Mosaic browsers couldn't deal with applets. But that has changed. Most web browsers today can—or soon will be able to—process applets. Once your web browser can handle applets, if you are otherwise happy with it, there is no reason for you to use Sun's HotJava browser.

> *Our users will not be amazed that they can access pictures in New Zealand in seconds when what they need is to get budget projections from an office in the next building.*

JavaScript is a language similar to Java, but an order of magnitude easier to use. Someone comfortable in any programming language, even Basic or HyperTalk, could probably quickly learn to code in JavaScript. While Java applets are separate applications that interact with a web page, JavaScript scripts are extensions to HTML that allow web pages to interact with users and the browser environment. Scripts are part of the HTML. A script typically consists of a few functions that react to mouse clicks, mouse moves, data being entered, and other things that might happen to a web page. For example, a script might perform a computation or table look-up as a user entered data into a field. A script could check the range of data and ensure that social security numbers, for example, were the right length and were numeric. While applets can do much more dramatic things than scripts, scripts are much easier to write.

While it is clear that Java has permanently raised expectations of what the World Wide Web should deliver, it is not clear that Java will be the primary way in which that is done. Scripting languages such as JavaScript, and a multitude of plug-ins, add-ons, and programs from every software vendor will become a part of every outstanding web page in the near future. While this may dazzle, entertain, and educate users more than anyone might have thought possible, web publishing will become much more complex and expensive. Better tools, far more technical expertise, and more serious design and layout skills will be required to produce outstanding web pages. It will no longer be enough to know even the most arcane corners of HTML. HTML-generation programs that couldn't quite keep up with how fast HTML was changing will be hopelessly inadequate in the face of Java, JavaScript, and their ilk. Just when it seems that the web freed on-line publishers from their dependence on programmers (with

whom they shared no common experiences), Java and its brethren have conspired to force them to reunite. At least for a while.

Dear Webby: Our students, faculty and staff keep using unsupported software that they get free from the web or just buy from some mail-order catalog. They also keep using unsupported features of programs that we do support. It has gotten so bad that our users frequently call us with questions about things our help desk has never even heard of. We publish a list of software and features that we support. How can we get our users to stick to the software that we have determined is best for them? Sternly, Jill Bligh.

Dear Jill: As you no doubt see, your users have access to oceans of free software which they can obtain from the web. The time has passed when you made all the announcements of new software and features. Now those alluring announcements appear on the web and you and your users get to see them at the same time. The concept of supported web software is hopelessly out of date. In the past, you always supported the critical software that your users used. That shouldn't change now. What has changed is that you no longer determine which software your users use. Now they decide. This doesn't mean that there isn't beta software, recommended software, and software for which you have extra expertise. But you have to stay close enough to your users to know what software they are using, and then you have to learn enough about it to help them.

Beta versions of free web browsers regularly appear, as do free copies of plug-ins and other software. Users even start up their own web servers and use new web features before you've even read the announcements for them. Your users are using this stuff because they are convinced that it improves their productivity (it's also easy and possibly even fun). By insisting that your users use only the software you have deemed "supported" you will either be ignored or you will have a mutiny on your hands. Your users will not change. The rules have changed and you have to accommodate your users or you will be forced to abandon ship.

Dear Webby: The Internet and the World Wide Web changes everything. I would have thought you'd know that by now. All the rules of information technology are out the window. The road ahead is so different than where we've been that we will have to invent totally new ways of doing everything. Your old fashioned, conservative, puritanical advice just doesn't apply to this new era. Modestly, William Greats.

> *It is easy, even tempting, to become so wrapped up with this neat new technology that we expect our users to applaud us just for making it available to them.*

Dear Bill: No, Bill, the web and the Internet are evolutionary, not revolutionary. Just last week, using my $9.95 Home Depot USPS-approved mail box, I received 15 catalogs and magazines consisting of 2610 pages and including over 3000 high resolution color pictures. While it would have taken me most of a week to download this information using my 14.4 modem, retrieving it from my mailbox took just minutes. And using my $18 telephone in conjunction with these catalogs, I was able to conduct electronic commerce over the net (the telephone net, that is).

The Internet and the World Wide Web certainly allow us to do things a little differently than we could before, but they don't change what IT organizations should be trying to do for their users or even the basic rules of how they should do it. It is easy, even tempting, to become so wrapped up and enthusiastic with this neat new technology that we expect our users to applaud us just for making it available to them. But our users really need us to help them get their work done. We cannot compromise the reliability, security, integrity, efficiency, accuracy, effectiveness, and timeliness of what we do for our users—no matter how neat the new thing is that we give them. Our users will not be amazed that they can access pictures in New Zealand in seconds when what they need is a budget projection from an office in the next building. The cries of adulation will come only when we do not compromise the services we provide.

Standards, planning, documentation, attention to detail, understanding the real needs of your users, and exceeding their expectations are just as important with this new technology as with any technology. The web and the Internet are only new tools that will help your users get where they are going. Their destination has not changed. As you travel the road ahead, you must not lose sight of where you are taking your users or why they are going there. ■

Human Dimensions in the IT Support Crisis

by Ken Friedman, Norwegian School of Management

There are a number of dimensions in the computer support crisis. Financial and technical issues are at the front, but human and political issues come close behind. My comments come from the viewpoint of a faculty member.

We have a good IT department at our school. I'd say they are generally outstanding seen from my viewpoint as a faculty customer. Like many IT departments, they are overworked. The demands on their time and services go a little farther than the available resources. Like many faculty, I'm just barely computer literate. I couldn't work with a computer until the Macintosh arrived with "a computer for the rest of us." Even with the Mac, I've sometimes had to struggle, but I get by fairly well today. The computer has become an indispensable tool for writing and now the Internet has become a major tool for research and communication.

In private life, I've had to rely on support from suppliers of computers or software. Now that I'm at a school with superb support services and a completely wired environment, I have a number of choices. When I have a problem, I weigh it in an intuitive fashion to decide whom I should call for help.

If it's a hardware problem, a connectivity problem, or the need for new software, I call on the IT people. There was an initial phase when I had a bad machine. While I waited for a new machine I was a regular and troubled customer. When I got my new machine, I needed help making things work, especially since I needed software that was common in the US and hard to find in Norway. As I gained skill and knowledge, I called on the IT department less and less. Now, it's only the need for something new or help in an emergency that leads me to call them.

One thing I observed was that one of the computer staff failed to see the difference between stages in a user's development. As a result, he often lost patience with me. Even though he was also an undergraduate student at our school, he didn't seem to recognize that he was a teacher for those of us who needed to learn to use computer resources. He didn't seem to understand that I was as bewildered and as much at a loss for what to do with computer problems without his coaching as he would be in an advanced research project designed for postdoctoral scholars in management without social help.

It seemed to me that he looked down on me for the inability to solve my computer problems with a few words over the phone. He failed to see that what he saw as simple things were difficult for me. Good teachers show students how to recognize patterns and help them to see how the parts of things fit together. That's an important and conscious step in coaching people toward independent exercise of judgment in any field. He would often give curt, cryptic instructions that would be fine for an educated user but made little sense to me. As a result, I'd be back again and again and he lost patience with me. For my part, after two or three days of visits and polite requests, I occasionally became sharper than necessary when desperate. When you've got deadlines, when everything depends on your computer and your printer, and when the machines aren't working, it's an unfortunate human tendency to push a bit and to remind the IT people that they're there to make things work. He was an extremely intelligent, skillful computer person, but he failed to recognize that an IT department involves both technology and people.

Our other IT person saw the distinctions. As it happens, I've learned a lot more over the last year, and I've moved from being both a learner and a customer to being a customer. Now, I only come for help in emergencies, usually hardware or connections.

When it comes to software, the faculty and research fellows practice self-help and mutual support. I have three expert users within twenty meters of my office, and I turn to them whenever I need help. In turn, I help colleagues in managing some of the programs that I have become reasonably good at using and I help them with the simpler rudiments of making their Macs work. This is an excellent solution. It seems to me that the conscious development of faculty self-help teams can free IT departments to concentrate on danger points—and can help them to realize that people who come to them do need help.

The area where I'd say faculty and IT need to understand each other and work together more carefully is in the transition area for new users who have just got their machines or set-ups on-line. Even though faculty help each other with software and making things tick,

---

Ken Friedman is an associate professor in the Leadership and Strategic Design department of the Norwegian School of Management in Oslo, Norway. This article first appeared as a posting to the AAHESGIT listserv.

there's none of us who know the machines well enough to handle the trickier parts of initial set-ups and making things fit together. Even when it finally makes sense as we witness the experts handle problems, we just don't work enough with equipment or operating systems to keep the knowledge fresh and explainable to others.

The allocation of resources in any system is a matter of priorities, politics, and people. This kind of issue affects many departments, particularly in a European school where sometimes antiquated notions of faculty status get in the way of a school that sees itself as a single community of knowledge and service. The slow growth of community between faculty and librarians is an example of this. Library services have only recently been given the respect and importance they deserve at our school. Some of us believe that library staff are an important part of the faculty, but generating a consensus for that view takes time.

This is related to several other issues. One is the growth of our school from having a primary mission as a direct teaching institution to having an enlarged mission as an institution dedicated to research and to research-based education. We have had many faculty members who are not productive researchers and who therefore never use the library. I don't know how it is in other schools, but I suspect that the growing status of the library staff is directly proportionate to the growing research productivity of faculty members. I suspect that within a few years, this will also be true for members of the IT staff—at least those members of the IT staff who have interface and education functions toward faculty and administrative staff.

My suggestion for those of you concerned with the IT support crisis is to talk things through on the many levels where you have to work. IT is reshaping education, so you'll have to do this sooner or later. AAHE (American Association for Higher Education) is helping a number of local "Teaching, Learning, and Technology Roundtables" to address these issues in teams that include members from each of the stake-holding constituencies. I gather they've been very productive for those who have taken part, and I'm hoping that we can eventually host one here for schools in the Nordic nations. In the meantime, broad dialogue goes a long way.

Even in schools with the most up-to-date equipment and completely staffed IT departments, crises will continue simply because the support crisis is a matter of human interaction and the political allocation of resources. Good dialogue among all parties helps in areas where no amount of new funding can make a difference. ■

"Technology provides more flexibility than traditional teaching methods once one moves beyond minor changes that can be instituted by individual professors. The 'career' of a workstation may well be less than five years, whereas that of a professor often exceeds 30 years. Workstations don't get tenure, and delegations are less likely to wait on the provost when particular equipment items are 'laid off.' The 'retraining' of IT equipment (for example, reprogramming), while not inexpensive, is easier and more predictable than retraining a tenured professor. Within limits, departments will gain a larger zone of flexibility as the capital-labor ratio grows."

William F. Massey and Robert Zemsky
Using Information Technology to Enhance Academic Productivity
Educom, 1995

In Future Issues

- *When doing strategic planning for IT is <u>not</u> a good idea*
- *What, if anything, IT has to do with institutional quality*
- *New system implementation: basic guidelines for success*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (203) 242-3356.

EDUTECH RESPONDS

Q. As the head of one of the largest administrative departments on campus, and one that is heavily dependent on technology, I have found that the only way to succeed is to do things for ourselves. If we had had to wait for the IT department to get around to helping us, we would not be as far ahead now as we are. We've used our own budget to get and develop what we need, and we've done a lot of very good work. Now the IT department wants us to join with them to work together with other departments on a new project that will supposedly benefit the whole campus (a smart-card system). I'm not really inclined to do this, but I don't want us to look like we're standing in the way either. Any advice?

A. *You need to weigh two different sets of costs and benefits: one for your department and one for the campus as a whole. (We're assuming you haven't been given a directive to participate in the new project from the upper administration and that the decision is totally yours to make). Consider also that while you may have achieved great success in the past with things that were for your department only, a smart-card project really does have campus-wide potential and your participation is likely to make the results of the project that much better. It's possible that in this project, you can be a role model for other departments - in terms of coming to grips with technology and employing it effectively. It may be just the right time to be a good soldier and let the campus benefit from your experience.*

Q. We are considering the possibility of outsourcing our entire IT area. But what happens if we want to bring it back to campus in a few years? Will we be able to do this, or is outsourcing a "forever" decision?

A. *It doesn't have to be, but there are some things you will need to do to ensure you have the flexibility to make this choice in the future. The most important is that the top administration needs to stay (or become) involved in IT and not look at outsourcing as a way to stay out of the fray, so to speak. From the president on down, there needs to be a good, well educated understanding of the costs, benefits, and potential of IT on campus and that even with outsourcing, they need to fulfill their responsibilities by staying informed and involved.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper

3-26-96
AIE

March 1996
Volume 11
Number 12

THE EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

"The Productivity Paradox"

by Paul Attewell, City University of New York

Despite years of investing in computing systems designed to handle administrative tasks and to control costs, many colleges and universities find that their administrative staffs continue to grow. This parallels the experience of corporations, where even larger investments in information technology have failed to stem the expansion of managerial staffs or the costs of administration.

Scholars in recent years have tried to understand this "productivity paradox"—why spending huge sums on new information technologies has not raised white-collar productivity very much. In a book published by the National Research Council's Committee on Human Factors, *Organizational Linkages: Understanding the Productivity Paradox* (National Academy Press, 1994), other scholars and I summarize the research on this question.

For several decades, computer manufacturers have asserted that the technology they were selling would produce major breakthroughs in productivity, allowing a given volume of administrative work to be done by far fewer workers, at much less cost. Instead, as we are coming to realize, information technology has led to a displacement of efforts; many new things are being done by a work force of the same or larger size, rather than the old work's being done by fewer employees. Often, no money is saved at all.

One example of this displacement is that people use technology to enhance the appearance of documents, rather than simply produce paperwork more quickly. Two decades ago, typists fiddled with correction fluid and margin settings. Today's word-

continued on page 3

"What sort of 'information literacy'—an often-used but dangerously ambiguous concept—should we be promoting, and what should it accomplish? Is it merely something that will reduce the number of tech support calls we have to deal with?... Or is it, should it be, something broader, something that enables individuals not only to use information and information technology effectively and adapt to their constant changes but also to think critically about the entire information enterprise and information society?"

Jeremy Shapiro, Shelley Hughes
"Information Technology as a Liberal Art"
Educom Review
March/April 1996

NEWSBRIEFS

GRANT OPPORTUNITY FOR TEACHING WITH TECHNOLOGY

The National Endowment for the Humanities Division of Research and Education Programs has announced a special, three-year opportunity for the support of Teaching with Technology. These projects are designed to strengthen education in the humanities by developing and using new information technologies, including digital audio, video and imaging, hypertext and hypermedia, videoconferencing, speech processing, and the Internet. The Endowment seeks to increase the number and usefulness of technological resources with high-quality humanities content; to improve the effectiveness of such resources by basing them on sophisticated, creative, and engaging approaches to teaching and learning; and to increase the number of teachers who can integrate these materials into their daily teaching.

The initial deadline for receipt of applications for grants is April 5, 1996. For more information, contact the Division of Research and Education, Room 302, National Endowment for the Humanities, 1100 Pennsylvania Ave. NW, Washington, DC 20506; (202) 606-8380; education@neh.fed.us.

SUMMER PROGRAM IN MULTIMEDIA

The Summer Program in Multimedia for Higher Education will provide a creative and stimulating environment for faculty to foster the creation of academic multimedia. The Program, to be held at the Tisch School of the Arts at New York University, is seeking faculty whose ideas for multimedia promise to become exemplary works in their field. Up to eight academic faculty will spend June 1–30 mastering appropriate techniques and vocabulary as they develop innovative and pedagogically sound prototypes. The agenda will also include guest lectures, critiques of other works as examples of good (or poor) design, and trips to exhibits and cultural events. A stipend of $5000 will be provided to each faculty participant.

Interested persons should submit their application and a c.v. by April 1 via e-mail to Susan Saltrick, Executive Director, at: spmp@voyagerco.com with the following information: name, institution, departmental affiliation, and a brief (up to three pages) description of the idea. For more information, contact Susan Saltrick at (212) 877-0840; saltrick@inch.com.

ISSUES IN NETWORKED INFORMATION

Networked information issues in higher education will be the focus of a regional conference sponsored by CAUSE and the Coalition for Networked Information this May 30–31 at the University of Pennsylvania. Speakers will describe how their campuses deal with network infrastructure and access to scholarly information. Topics will include telecommunications legislation, information discovery and retrieval, and administrative computing.

For more information, contact CAUSE in Boulder, Colorado at (303) 939-0315; conf@cause.colorado.edu.

The EDUTECH REPORT is published each month by EDUTECH International, 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (LFLEIT@EDUTECH-INT.COM); Vice President: Emily Dadoorian. Copyright © 1996, EDUTECH International. All rights reserved. This publication, or any part thereof, may not be duplicated, reprinted, or republished without the written permission of the publisher. Facsimile reproduction, including photocopying, is forbidden. ISSN #0883-1327. One year subscription, $97.

"The Productivity Paradox"...

continued from page 1

processing software makes such editing child's play. But the time freed up by the software now is used to create elegant layouts, striking combinations of fonts, pie charts, and other graphic innovations.

Another example of this displacement is in the mix of face-to-face and written communications in organizations. Laboratory studies show that written communications tend to be more detailed—and therefore to take longer to produce—than spoken communications, even when the purpose of the message is the same.

The current explosion of electronic mail, though enormously helpful in certain ways, is nevertheless pushing communication towards the slower and more wordy medium of written messages, rather than toward the faster and less wordy channel of telephone or face-to-face conversations.

More interactions

The problem of communication goes beyond this, however. Research in the corporate sector shows that information technologies offer more ways to communicate and add to the already heavy volume of interactions that each employee handles.

It is not unusual to find white-collar employees receiving a communication (electronic, paper, or oral) every five minutes. This can fragment their work day and lead to a sense that there is never a free moment to get one's "real work" done.

For example, researchers studying the productivity of different software-programming teams expected to find differences in productivity associated with different programming languages. But, to their surprise, the strongest predictor of productivity was whether the team had a support person to answer the phone and shield other members from interruptions.

The current explosion of electronic mail, though enormously helpful in certain ways, is nevertheless pushing communication towards the slower and more wordy medium of written messages, rather than toward the faster and less wordy channel of telephone or face-to-face conversations.

More information

Further problems occur because, as computer systems have made information much cheaper to collect and manipulate, the demand for information has skyrocketed. Leaders of organizations, including college and university administrators as well as corporate executives, expect the costly electronic systems they purchase to provide an ever-finer picture of what is going on.

For instance, are more students enrolling in large lecture courses than in previous years? Are recent graduates contributing as much to their alma mater as graduates of earlier classes did? Thus, information systems create escalating demands for data and fuel the growth of a "management by numbers" culture, emphasizing quantitative data and spreadsheet modeling as central to good organizational decision-making.

Unfortunately, as Fred D. Davis, professor of information systems at the University of Maryland at College Park and his collaborators, Jeffrey E. Kottemann and William E. Remus, reported recently, the current penchant for numerical modeling often is wrong-headed. In their studies, they found that managers often overestimated the accuracy and superiority of computer models, creating what the researchers called "the illusion of control" and "cognitive conceit." Administrators felt that computer models generated better decisions even when this was not really true. But this assumption spurred them to demand more and better information systems.

This management by numbers also places greater burdens on administrators, who must spend hours (often at home) preparing spreadsheets as rationales for requests that, a generation ago, might have been made in a simple memorandum.

Savings offset

Ironically, the one personnel category in which employment has been reduced because of information technology is that of clerical workers, such as secretaries and typists. But, unfortunately, the

continued on page 6

Paul A. Attewell is a professor of sociology at the Graduate School and University Center of the City University of New York. *This article first appeared in The Chronicle of Higher Education and is reprinted with permission.*

Acquiring Classroom Tech

by Glen M

As a reader of this newsletter you probably recognize the potential for technology to enhance the learning process and increase the productivity of our educational institutions. The vision of these tools becoming integral to the curriculum is finally becoming a reality. The *1995 Campus Computing Survey* conducted by Kenneth C. Green showed the first significant increase in curricular use of computers during the past decade. For instance, the use of commercial courseware in the classroom increased nearly 50% to around 18% of college courses.

Still, the fiscal policies and procedures by which most institutions acquire computers and related courseware is now a greater impediment to progress than the technology itself. The purchasing process, based primarily on infrequent and unpredictable capital outlay, is increasingly out of sync with the needs of educators and students, and is in fact counter to what most institutional and state fiscal policy attempts to accomplish.

The need to stay current

During the past few years, the power per dollar-value of computer hardware has accelerated at a dizzying pace, and this trend will continue with advancements in microprocessor design, manufacturing efficiencies, and increased competition. Desktop systems capable of running power-intensive multimedia courseware are now available for well under $2000, a fraction of the cost of only a couple of years ago. At the same time, software, especially multimedia solutions incorporating graphics, video, and sound, continue to exploit the available power.

We are constantly in a catch-up mode, usually years behind the curve, with needs and budget-dollar availability at odds with one another. Everyone loses here... our students, our institutions, and ultimately our country.

We know the trend toward distributed multimedia and related technologies will continue with the proliferation of CD courseware and the World Wide Web.

So, on the hardware side, we have precipitously falling pricing and rapid obsolescence. On the software and content side, we have ever-increasing power requirements to take advantage of the new technologies. In this environment, it is easy to understand why infrequent cash outlays to acquire personal-computer-based learning technologies will not enable our institutions to provide the best for our students and to stay as current as they need to be with technology.

An old paradigm

Just how did we get into this predicament? A look back at the beginning of the desktop revolution offers some insight. When the personal computer first appeared on the scene in the early 1980s, computing was centralized and primarily to support large batch processing needs of our institutions. At that time, mainframe computers were leased. Personal computers were not taken seriously for the most part (certainly not as tools for the classroom). Because the whole category was new, the machines were inexpensive when compared to mainframes, and there was no way to predict the long-term viability of the technology, purchasers simply paid cash. Certainly, at the outset of the shift to desktop systems, that seemed like a good decision.

Now, we know better—but for the most part we continue our old habits. For the past six years, the *Campus Computing Survey* has tracked institutional plans to deal with technology budgeting. During this period, among the 1000 institutions surveyed, there has been little progress made toward developing capitalization plans to acquire and retire computers, software, and related technology resources. Most institutions continue to buy on an *ad hoc* basis when dollars are available. Less than 20% have any plan for retiring and acquiring technology over the long term.

Unfortunately, even with signs that technology is finding its way into the classroom, personal com-

Glen McCandless is president of Focus Marketing, a consulting firm that helps technology companies market their products to schools. He has been involved with the promotion of electronic technology for over fifteen years, and has a special interest in computer-based learning solutions.

ology: A Case for Change

ındless

puters remain primarily productivity tools in most of our institutions, and classroom teaching remains very much the same as it always was. Major changes in instructional activity have yet to be accomplished. Buying computers outright that are to be used as productivity tools can sometimes be justified, especially if they are being used as electronic typewriters. Let's face it, many schools are still using the mimeograph machines they had when I was a kid! (Could it be the wonderful smell of the duplicating fluid?)

For acquiring the learning-support tools that are computer-based, the current paradigm just doesn't work. Typically, the faculty becomes aware of new technology, enters into a lengthy process of decision making, begins a political process to justify the investment, and then sometimes meet with success in prioritizing dollars to purchase new computers and software. From the recognition of the need to the cutting of the purchase order commonly takes a year, sometimes two. In the meantime, technology marches on, and by the time the acquisition is made, the solution is well on its way to being obsolete. The dollars expended are thus devalued immediately.

We are constantly in a catch-up mode, usually years behind the curve, with needs and budget-dollar availability at odds with one another. Everyone loses here... our students, our institutions, and ultimately even our country.

The traditional response to this technology budgeting crisis is to try to find additional sources of funding—not a bad approach, but certainly a band-aid on a large wound. There are millions of dollars of grant money available through public and private foundations that support acquisition of technology in our institutions. There are consultants who make a living helping educators find and get their piece of the pie. Others pursue vendors for donations and deep price discounts. The outcome of all this activity to find money is still the same—the purchase of soon-to-be obsolete technology with the funds. Then the process begins over again. This is terribly unproductive for everyone concerned. Yes, we need to find more money, but even more important, we need to spend it more wisely!

> *Our institutions must prioritize the resources necessary to develop a long-range technology plan that includes capitalization based on the reality of technology. Without such a plan, we remain in a reactive mode.*

Time for change

It is time for change. Several steps must be taken by the stakeholders to break our bad habits and get us on the right track.

First, we must collectively do everything we can to elevate the severity of the problem and articulate its consequences to the financial policy makers in our institutions. Until the stakeholders (faculty, administrators, governmental policy makers, and vendors) recognize the price we pay by following our current purchasing methodology, there is no hope of change!

Next, we must change the fiscal policies for acquiring technology. The zero-based budgeting model by which funds evaporate on June 30 does not accommodate long-term financial commitments for technology. This policy runs up costs which get passed along to parents and students through tuition increases.

The costs for personal computers, courseware, and related networking technologies must be reclassified as ongoing operating expenses and supply items, just like the telephone, electricity, and other common essentials. Technology for our classrooms is not a luxury. It's not a one-time expense. It must be budgeted for and paid for as any other necessity.

Our institutions must prioritize the resources necessary to develop a long-range technology plan that includes capitalization based on the reality of technology advances. Without such a plan, we remain in a reactive mode, scrambling to find money to buy things we need to get the job done.

Finally, the vendors of software and hardware and their financial partners must find ways to deliver customized subscription and leasing programs that will get us out of this unproductive and costly paradigm by which we now acquire learning technologies.

continued on page 7

BEST COPY AVAILABLE

"The Productivity Paradox"...

continued from page 3

saving often has been offset by the hiring of more professional and managerial workers, at far higher rates of pay, who produce their own reports and correspondence on personal computers and answer their own phones. Thus, government data show that the proportion of the work force employed in managerial and professional positions has grown continually in the past several decades in almost all sectors of the economy.

Enhanced service

Despite these problems, the information revolution has been a great success in one area—enhanced services for individuals.

Who does not enjoy the convenience of 24-hour banking at automatic-teller machines? What college student is not happy to select courses and register by phone, using electronic technology?

But even these successes have resulted in a displacement of energies, a new set of priorities, and added costs, rather than an increase in productivity or financial saving.

For example, it has been shown that customers using automatic-teller machines tend to make withdrawals more frequently, and in smaller amounts—thus increasing the total volume of processing work for banks.

Similarly, students at Columbia University eagerly embraced the register-by-phone technology when it was introduced there recently. But they particularly liked the feature that searched for unfilled classes in a specified time slot. Their heavy use of this capability brought the computer system to its knees. Members of the computer staff had to disconnect that feature to preserve the registration system.

What such examples teach us is that computers, even as they provide better service, generate an increased volume of work, demands for more computers, and new costs. The directors of college computer centers are likely to approach administrators each year with requests for more-powerful machines—needed to handle new registration software or greater electronic-mail traffic or additional links to the Internet to meet burgeoning demands for access to the World Wide Web.

What such examples teach us is that computers, even as they provide better service, generate an increased volume of work, demands for more computers, and new costs. The directors of college computer centers are likely to approach administrators each year with additional requests.

Thus, while the new services provided by information technology may be a boon for individuals, they cannot substitute for the original promises of increased productivity and lower administrative costs. If technology cannot provide a silver bullet for containing costs throughout higher education, what we are faced with is, unfortunately, a much less palatable alternative.

Academic administrators must scrutinize their own staffs, determine how employees spend their time, try to understand why the staffs have grown so large, and begin the painful task of setting priorities and cutting back their activities to focus on what is absolutely necessary—rather than what would be interesting or possible to do. And in doing so, they should avoid the well-worn, but misdirected, path of reducing the numbers of secretaries and clerks, while increasing the ranks of deans, assistant deans, and other highly paid professionals. ■

Editor's Note: For another slant on "the productivity paradox," we recommend reading the newly published *Administrative Computing in Higher Education*. Edited by Les Lloyd of Lafayette College, the book is made up of contributions from a wide spectrum of institutions, including Bryn Mawr College, California State University Stanislaus, Franklin College, Rutgers University, Kenyon College, and the University of Massachusetts.

Topics include everything from choosing a new system using a selection committee, campus-wide networking, and distributing data through client/server models to providing data access to faculty, adapting legacy systems, reengineering administrative processes, and, of course, planning.

The book is published by Information Today, Inc.; 143 Old Marlton Pike; Medford, NJ 08055, and costs $39.50 in the hard-cover version.

Acquiring Classroom Technology: A Case for Change...

continued from page 5

For a variety of reasons, commercial leasing programs have had limited acceptance in our institutions. Programs could be developed relatively easily which would allow colleges and universities to budget a regularly scheduled outlay for information technology. This would serve to ensure that the institution's students and faculty have access to the best and the latest tools to improve learning and to increase productivity by providing for continuous built-in upgrade, support, and training programs.

With the relative costs of these technologies decreasing over time, the prospects for steady, or even decreasing, outlays are quite real. Vendor sales representatives need to understand and be able to communicate the benefits of new financial approaches, including the possibility of leasing, and offer these as the standard purchase methods, not just possible alternatives.

Act now!

Changing the system isn't easy, but sticking to the status quo when it comes to providing our students access to exciting multimedia learning technology that is now available will have devastating consequences to the current educational system in this country.

We all have a stake in pushing for change. Raise this issue with your colleagues, both faculty and administrators. Write letters to your state legislators and federal representatives. Get the help of your technology suppliers. And by all means, enlist the support of your fiscal and business officers to change current policy. Let your voice be heard!

If we all understand and recognize the benefits to be derived from ongoing financial support for technology acquisition, we will see major changes: increased institutional productivity, improved student retention, a better learning environment, and cost savings to our embattled budgets. As a result, the students we graduate from our technology-enhanced institutions will help put our country in a much improved position with respect to global competitiveness. ■

"The thought of changing administrative software is daunting at best, and the more automated the administrative process already is, the more frightening it becomes to think about a total conversion of the existing system. Computers and software affect the way people work in fundamental ways, and unless change is perceived to mean improvement, it is not welcome. We are all familiar with the stubborn resistance that can undermine good projects because key people feel excluded from the planning and decision process.... For a change to be successful, people at all levels of the organization need to feel involved, their ideas must be heard, and they must accept responsibility for the project."

Dagrun Bennett
"The Administrative Software Evaluation Committee"
Administrative Computing in Higher Education
1996

In Future Issues

- *What, if anything, IT has to do with institutional quality*
- *When doing strategic planning for IT is not a good idea*
- *New system implementation: basic guidelines for a successful project*

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities. Call us at (860) 242-3356.

EDUTECH RESPONDS

Q. One of our high-level managers is a technology whiz, and his expertise is both known and appreciated far and wide. The problem is that everyone really hates this guy—his social skills are abysmal and over the years, he has managed to alienate just about everyone on campus at one time or another. That didn't used to be as much of a problem as it is now, with resources shrinking and users expecting better treatment from us. I have to keep asking myself if his technical skills are worth the price we're paying.

A. *An excellent question, especially if "price" includes the damage being done to your department's credibility and reputation. As you point out, there was a time—not long ago—when we not only had to tolerate the prima donnas because their numbers were so few and we needed them so badly, but we also wanted to tolerate them in some ways as well. After all, some part of us admired them. And they were idiosyncratic (weird?) enough to provide some entertainment value, at least once in a while. Now they're just annoying, and worse, they contribute mightily to the perception in the community of computing types being aloof, condescending, unapproachable, and just generally strange. Not exactly the image that most IT managers in higher education want to project these days.*

Q. Last month, you talked about the need for institutional management to stay involved in IT, even if the whole area is to be outsourced. I agree with this, but since one of our concerns is maintaining the ability to bring the operation back in-house someday, doesn't our outsourcing vendor have a responsibility here too?

A. *Yes, absolutely. The company that provides you with outsourcing should have a process that allows you bring the operation back in-house at the end of the contract, should you choose to do so. This would include creating a plan, recruiting a staff (especially the managers), transferring knowledge, and transitioning services so that the change is not disruptive. Outsourcing vendors certainly tend to emphasize the value of their activities at the beginning of the relationship; their activities need to be just as strong and high-quality at the end.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Clearing House on Info Resources
030 Huntington Hall, Sch. of Ed.
Syracuse University
Syracuse, NY 13210

printed on recycled paper